# THE ENGINEERING AND MINING JOURNAL.

WITH WHICH IS INCORPORATED

## THE COAL AND IRON RECORD.

VOL. XX.—No. 2. NEW YORK, SATURDAY, JULY 10, 1875. PRICE 10 CENTS PER COPY.



## THE ENGINEERING AND MINING JOURNAL

***Is devoted*** to MINING, METALLURGY, and GAS ENGINEERING.

***It is the only paper officially authorized*** to publish the proceedings, transactions, and bulletins, of the American Institute of Mining Engineers, including all the valuable papers read before that influential society.

***Correspondence*** and general communications and books for review should be addressed to MR. ROTHWELL. Business communications should be addressed to the Secretary.

***Remittances*** should always be made by Post-Office Orders or Bank Drafts, made payable to WM. VENTZ, Secretary.

***Subscription*** $4 per annum ; $2.25 for six months, in advance.

***Advertising Rates.*** Inside pages 25 cents per line each insertion. Outside pages 40 and 50 cents per line. Special rates will be given on application for advertisements extending over a long time or occupying a large space.

***Agencies.***—Philadelphia, B. BLOMFIELD, 30 North Fifth Street ; Pittsburgh, C. McF. REED, 122 Fifth Avenue ; Boston, WM. H. NEWCOMB, 112 State Street.

RICHARD P. ROTHWELL, C. E., M. E.
ROSSITER W. RAYMOND, Ph. D., } Editors.

THE SCIENTIFIC PUBLISHING COMPANY.

WILLIAM VENTZ, Secretary,
27 Park Place, New York.

P. O. Box 4404.



## COUNCIL BLUFFS IRON WORKS,

CAPITAL, $100,000.

**Manufacturers of Mining Machinery, Quartz Mills, Smelting Furnaces, Pumping and Hoisting Machinery,**

IRON AND BRASS CASTINGS OF ALL KINDS.

**OFFICE AND WORKS LOCATED AT COUNCIL BLUFFS, IOWA, at the Eastern Terminus of the Union Pacific Railroad.**

Address R. J. CORY, Secretary.

## SCHOOL OF MINES, COLUMBIA COLLEGE.

FACULTY.—F. A. P. BARNARD, S.T.D., LL.D., PRESIDENT, T. EGLESTON, JR., E.M. Mineralogy and Metallurgy ; F. L. VINTON, E.M., Civil and Mining Engineer; C. F. CHANDLER, PH. D., Analytical and Applied Chemistry ; JOHN TORREY, M.D., LL.D., Botany ; C. A. JOY, PH. D., General Chemistry ; W. G. PECK, LL.D., Mechanics ; J. H. VAN AMRINGE, A.M., Mathematics ; O. N. ROOD, A.M., Physics; J. S. NEWBERRY, M.D., LL.D., Geology and Paleontology. Regular courses in Civil and Mining Engineering; Metallurgy; Geology and Natural History ; Analytical and Applied Chemistry. Special students received for any of the branches taught. Particular attention paid to Assaying. For further information and catalogues, apply to

DR. C. F. CHANDLER, Dean of the Faculty.

## Colorado Bureau of Mines.

**383 Larimer Street,**

**DENVER, COL.**

Authentic Statistics of Mines and Mining Property in Colorado compiled and recorded.

Mining Property bought and sold on commission.

Reliable information given upon application by parties interested.

Address as above.

**HIERO B. HERR,**
Engineer and Sup't.

## PATENTS.

THOMAS D. STETSON,
No. 23 MURRAY STREET,
New York.

**Solicitor of Patents, and Scientific Expert in Patent Cases.**

## MINING AGENCY.

**ADOLPH MEZGER, Mining Engineer,**

FREIBERG, SAXONY,

Is willing in connection with the Mining Agency and Bureau which he conducts in that place, to accept the general or local agency for valuable American Mining and Metallurgical Machines and inventions, for Germany, Austria or Russia. Patents obtained in European States. Information furnished or supplies purchased and forwarded. Strangers visiting the mines and works of Freiberg advised and assisted.

Reference : the Editor of the ENGINEERING AND MINING JOURNAL

## THE PENN MUTUAL

LIFE INSURANCE COMPANY

**OF PHILADELPHIA.**

OFFICE No. 921 CHESTNUT STREET.

**Incorporated in 1847. Assets nearly $5,000,000.**

The Penn is a purely Mutual Life Company, and one of the oldest and most reliable in the country. All of its surplus premiums are returned to the members every year, thus furnishing them insurance at the lowest possible rates. Its Policies are all non-forfeitable for their value after the third annual payment. SAMUEL C. HUEY, President.
SAMUEL E. STOKES, Vice-Pres't, H. S. STEPHENS, 2d Vice-Pres't.
JAS. WEIR MASON, Actuary. HENRY AUSTIE, Secretary.

**AGENTS WANTED.**

## FIRE BRICK.

**B. KREISCHER AND SON,**
**58 Goerck street,**

Cor. Delancy street, East River, NEW YORK.

**Blocks, Slabs and Clay Retorts.**

Branch Works at Kreischerville, Staten Island. Established 1845.

## THE PENNSYLVANIA RAILROAD

IS THE GREAT

## TRUNK LINE AND MAIL ROUTE

**OF THE UNITED STATES.**

It traverses the most interesting portions of the North American Continent, and unites by unbroken tracks all the principal cities on the Atlantic Coast, on the Great Lakes, and in the Mississippi Valley.

Through trains are run over its lines between New York, Philadelphia, Baltimore, and Washington, in the East ; and Buffalo, Rochester, Erie, Cleveland, Detroit, Chicago, St. Louis, Cincinnati, and Louisville, in the North, West and Southwest.

**THE PENNSYLVANIA RAILROAD**

**Is the Best Constructed Railroad on the American Continent.**

Its main lines are laid with a Double Track of Steel Rails, secured on Oak Ties imbedded in broken-stone ballast, which renders them impervious to the action of frost or freshets, and prevents annoyance from dust. All bridges are of iron or stone, constructed on the best-known principles for safety and durability.

**THE PENNSYLVANIA RAILROAD**

RUNS THE MOST

**Perfect Rolling Stock in the World.**

Its engines are models of mechanical excellence, and its passenger cars are unequalled for comfort, elegance, and strength. Superior Hotels and Eating-Houses are provided at all essential points, which, from their excellence of management and reasonable charges, have become the model establishments of their kind.

**THE PENNSYLVANIA RAILROAD**

ENFORCES UPON ALL ITS EMPLOYES

**STRICT COURTESY and POLITENESS,**

In their intercourse with the public, and uses every effort to secure the comfort and contribute to the enjoyment of its patrons.

## BLOWING ENGINE

**FOR SALE.**

One horizontal Blowing Engine, with vertical blowing cylinders. Steam cylinder, 25 in. diameter by 60 in. stroke ; two blowing cylinders, 72 in. diameter by 60 in. stroke. The engine is geared so that the steam piston makes two revolutions for one of the blowing cylinders. The engine was formerly used at the Durham Iron Works, Riegelsville, Pa., to blow an anthracite furnace 55 ft. high by 15 ft. bosh. The furnace having been rebuilt of much larger dimensions, the old engine will be sold at a low price. Address,

**COOPER, HEWITT & CO.,**
*NO 17 BURLING SLIP, NEW YORK.*

## HENRY A. RILEY,

**ATTORNEY**

AND

**COUNSELLOR AT LAW.**

21 PARK ROW, NEW YORK,
Room 50.

Collections promptly made in all parts of the United States.

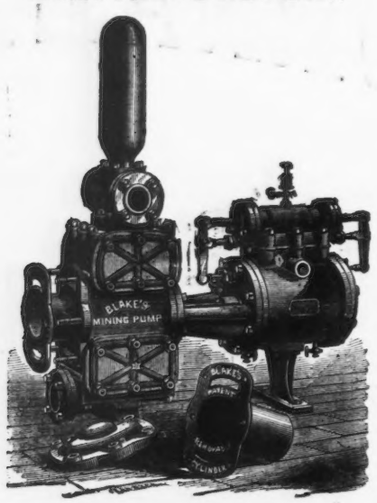
WANTED—BY AN OHIO COAL COMPANY, a Manager who can influence sales in the Western Trade. Address P. O. Box 2908, New York.

**BLAKE'S PATENT STEAM PUMPS.**

OVER 8,000 IN USE.

**Compact! Simple! Durable!**

**MINING PUMPS A SPECIALTY.**

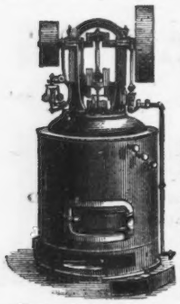



☞ Above cut illustrates our special Mining Pump with *patent removable cylinder.* Send for illustrated catalogue.

**GEO. F. BLAKE MANUFACTURING CO.**
**NEW YORK,**
**BOSTON AND CHICAGO.**

---

THE GREAT NEED SUPPLIED.



*Engine Ready for Use.*

"A simple, safe, durable, and economical motor of small size," **was the need.**

**The Baxter Steam Engine,**

From two to ten Horse Power, made by

**Colt's Arms Company,**

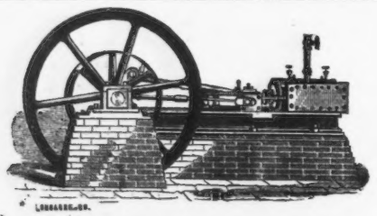
by special tools and machines, so that all parts can be exactly duplicated, **is the supply.**

Over 1000 are now in daily use, and the demand is increasing. Persons of ordinary intelligence can set them up and run them. They are the most economical engines ever invented. One common scuttle of coal will yield one Horse Power per day of ten hours, other fuel in proportion. Fully Guaranteed.

For circulars, with price list and testimonials, address,

**WM. D. RUSSELL,**
**Office of the BAXTER STEAM-ENGINE CO.,**
**18 Park Place, New-York.**

---



**CAMPBELL & RICKARDS,**

BUILDERS OF ENGINES AND TRAVELLING CRANES.

609 and 609 Commerce street, Philadelphia, Pa.

Estimates furnished on application.

Agents for Shive Governors.

---

**SHAPLEY STEAM ENGINE.**

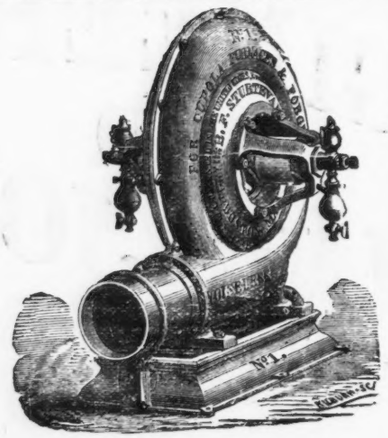
BEST AND CHEAPEST, SIMPLE, COMPACT, DURABLE, ECONOMICAL.

SEND FOR DESCRIPTIVE CIRCULAR.

**WILDE & CO.,** *SOLE AGENTS,*
20 Cortland Street, New York.

***Agents for Clark's Multiple Pressure Blower.***

---



B. F. STURTEVANT'S
**PATENT IMPROVED**
**PRESSURE BLOWER,**

FOR CUPOLA FURNACES AND FORGES.

Also manufacturer of the Sturtevant Patent Improved Fan Blower and Exhaust Fan. Send for illustrated catalogue.
B. F. STURTEVANT, 72 Sudbury street, Boston, Mass.

---

**STEAM PUMPS**

Manufactured by
**CRANE BROS. MFG. CO.,**
**Chicago.**

---

**The Root Safety Boiler.**

**OVER 1,200 IN USE.**

The distinctive claims presented by this Boiler are Safety from Destructive Explosion, utmost Durability, highest Economy, and greatest facility for Enlarging, Cleaning and Repairing.

☞ For Illustrated Catalogue, address

**Abendroth & Root Manufacturing Company**
*GREENPOINT, BROOKLYN, N. Y.*

---

**WILLIAM TAYLOR & SONS,**
*COLUMBIA IRON WORKS,*
**25 to 39 Adams Street, Brooklyn, N. Y.,**
MANUFACTURERS OF

**Improved Steam Engines**
AND
**Hydraulic Presses.**

Also, Hydrostatic Oil Presses for Cotton and Linseed Oil, and other purposes. Steamboat Engines. Hoisting, Mining, and Wrecking Machinery. Brass and Iron Castings of every description.

---

"CRESSON"
**CHEMICAL LABORATORY.**

COALS — *Analysis of* for gas purposes. for STEAM purposes. for SMELTING purposes

WATERS — *Analysis of* for HOUSEHOLD use. for MANUFACTURING purposes. for STEAM BOILERS

No. 417 WALNUT STREET, Philadelphia.

---

**WIRE ROPE**

Address, JOHN A. ROEBLING'S SONS, Manufacturers, Trenton, N. J., or 117 Liberty street, New York.

N. B.—Wheels and Rope for conveying power long distances. Send for Pamphlet and Circular.

---

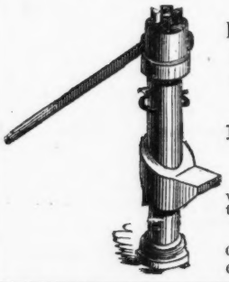
**JOHN ROBERTSON & CO.,**
**TUBAL CAIN IRON WORKS,**
Manufacturers of
**LEAD PIPE MACHINERY.**
Hydraulic Presses for all Purposes a Specialty.
127, 129 and 131 Water St., Brooklyn, N. Y.

---

**CARTER, ALLEN & CO.,**
**TAMAQUA IRON WORKS,**
TAMAQUA, PENN.,
BUILDERS OF FURNACES, ROLLING MILLS,
AND
**Mining Machinery,**
MACHINERY FOR COAL AND ORE WASHING,
*WINDING ENGINES OF THE MOST IMPROVED TYPE,* for Shafts, Slopes, Planes, &c.,
**Allen & Barton's Patent Duplex Steam Pumps,**
Sheaves for Wire Rope Transmission,
**Cornish Pumps of the Largest Capacity,**
**BOILERS OF ALL KINDS,**
*Plans and Estimates for all kinds of Machinery furnished.*
**Good Work and Reasonable Prices.**

---

**RICHARD DUDGEON,**
**No. 14 Columbia Street, New York.**



Maker and Patentee of
**Hydraulic Jacks & Punches, Rollers, Tube Expanders,**
AND
**Direct-Acting Steam Hammers.**

Communications by letter will receive prompt attention.

JACKS FOR PRESSING ON CAR WHEELS OR CRANK PINS made to order.

---

**HILLARD & HOLLAND,**
SOLE MANUFACTURERS OF
**Steam-Fittings, Lubricators, Water-Gauges, Fittings for Steam, Water and Gas, Heating Apparatus, Plain and Galvanized Wrought Iron Pipe.**
BRASS FOUNDRY:
**62 and 64 Cold Street, New York.**
J. L. HILLARD. T. HOLLAND.

---

**Machinery without Lubricant!**

**METALINE.**

*MACHINERY METALINED AND METALINE FURNISHED TO MACHINE BUILDERS.*

No oil or attention required. Runs with little or no wear. No dirt or danger from fire. No damage to goods in process of manufacture. Years in use by best concerns who are refitting old and ordering new machinery to be metalined.

**AMERICAN METALINE COMPANY,**
**61 Warren Street,**
**New York.**

---

**H. A. ROGERS,**
Importer and Dealer in
**Railway and Machinists' Supplies,**
**No. 19 John street New York.**
AGENT FOR
**Sturtevant's Blowers, Judson's and Pickering's Governors, A. G. Coe's Screw Wrenches.**
Boiler Felting, Steam Pumps, and Supplies generally.
Send for Prices.

---

**Hoisting Machinery**
Mfd. by
**CRANE BROS. MFG. CO.,**
**Chicago.**

Jaw Crushers.
Steel Crushing Rolls.
Concentrators.
Revolving Screens.
Elevators.
Hangers and Shafting.
Pulleys and Belting.
Laboratory Crushers.
Laboratory Concentrators.

**STEPHEN R. KROM,**
MECHANICAL ENGINEER,
MANUFACTURER OF MACHINERY FOR
**CRUSHING, SCREENING, AND CONCENTRATION OF ORES,**
For Pamphlets and information, address: S. R. KROM, 206 Eldridge St., New York.

PLANS FURNISHED FOR Ore Dressing Works.

THE
**BURLEIGH ROCK DRILL COMPANY,**
**FITCHBURG, MASS.**

Continue to manufacture the only reliable and economical Rock Drill yet invented. Send for our pamphlets giving certificates of use in all parts of the United States and Europe.

We give below an extract from the affidavit of WALTER SHANLY, Contractor at Hoosac Tunnel, used in our suit now pending against the Ingersoll Drill for infringement:

"The cost of repairs of the Burleigh Drill is, in my opinion, reasonable, the simplicity of the construction of the machine tending to keep down the cost of repairs and renewals. I have had a machine work for three months without needing repairs, and in that time it drilled the same as a hole a mile long and of two inches diameter."

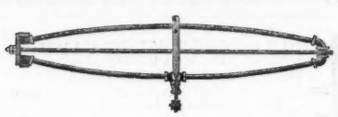
We can multiply evidence as to the efficiency and economy of this machine over all others; the insignificant cost of repairs being its particular advantage.

**New York Office, 115 Liberty street.**

**KNOWLES STEAM PUMP WORKS'**
92 & 94 Liberty St. New York.
**MINING PUMPS**
FOR HEAVY LIFTS AND BAD WATER A SPECIALITY.
BOSTON, 14 & 16 Federal St.
Factories WARREN, MASS.

**THESE ARE THE ONLY PUMPS**
ARRANGED TO WORK NOISELESSLY AND
**WITHOUT ANY SHOCK OR JAR**
ON PUMP OR PIPES
THESE FEATURES GUARANTEED

**BARR'S ELLIPTIC**



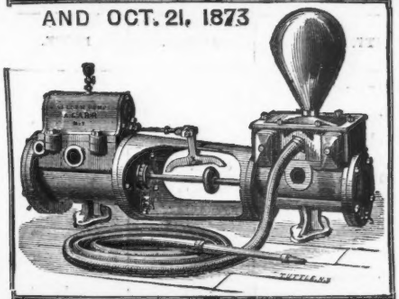
**Steam Trap.** (Patented December 16, 1873.)

For draining the water of condensation from Steam Pipes without loss of Steam.
Send for a circular.

Agents wanted.

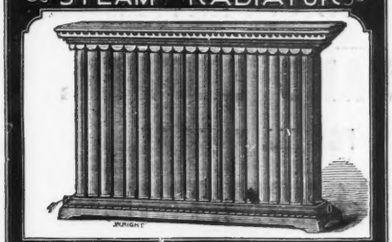
**RICHARDS & PIKE,**
Engineers and General Machinists,
205 Ledger Place, Philadelphia.

**THE SELDEN DIRECT-ACTING STEAM-PUMP**
PAT. AUG. 2, 1870. DECEMBER 20, 1870
AND OCT. 21, 1873



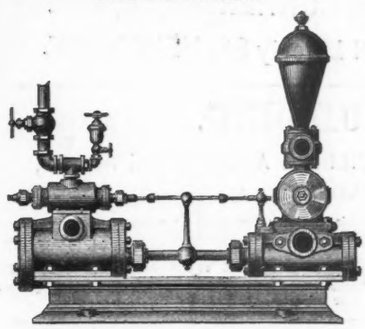
COMBINING SIMPLICITY AND DURABILITY TO A REMARKABLE DEGREE. IT'S PARTS ARE EASY OF ACCESS AND IT IS ADAPTED TO ALL PURPOSES FOR WHICH STEAM PUMPS ARE USED.

**A. CARR**
MANUFACTURER AND PROPRIETOR,
43 CORTLANDT ST. NEW YORK.
CARR'S POSITIVE CIRCULATING
**STEAM RADIATOR**



THE ONLY UPRIGHT STEAM RADIATOR MADE WHICH HAS A POSITIVE CIRCULATION.
ALSO
WROUGHT AND CAST IRON PIPE, BRASS WORK &c.
FOR
PLUMBERS, STEAM AND GAS FITTERS.
SEND FOR DESCRIPTIVE CIRCULAR & PRICE LISTS.

THE IMPROVED
**NIAGARA STEAM PUMP.**
SEND FOR CIRCULAR.

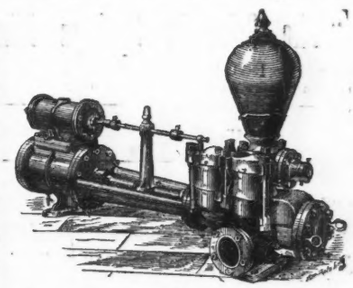


**HUBBARD & ALLER,**
SOLE MANUFACTURERS,
93 to 97 Pearl street, Brooklyn, N. Y.
Agency at 40 John Street, New York.
STEAM ENGINES AND ALL KINDS OF MACHINERY.

WOOD ENGRAVING
EXECUTED AT THE OFFICE OF
The Engineering and Mining Journal,
27 PARK PLACE, NEW YORK CITY.

**THE EARLE PATENT STEAM PUMPS.**

Simplest Mechanism.



Greatest Efficiency.

ADAPTED FOR EVERY POSSIBLE USE
**Extensive Varieties for Specific Purposes.**

Awarded Highest Premium at every Exhibition.—Vienna Weltausstellung, Paris Exposition, American Institute, N. Y., Mechanics' Association Fair, Boston, Maryland Institute Fair, Baltimore, &c., &c.

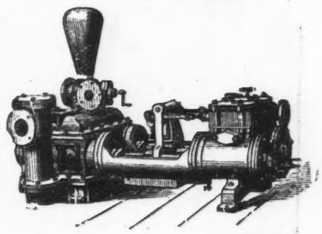
Additional improvements for 1875.—A new feature not obtained in any other pump is a *Changeable Lining*, or false cylinder of gun metal in the pump cylinder, which can be changed in five minutes, without disturbing any connections, thus making a practically indestructible pump. Send for circulars.

THE NORWALK IRON WORKS Co., South Norwalk, Conn.

**HYDRAULIC WORKS.**
MANUFACTORY.
**BROOKLYN, N. Y.**

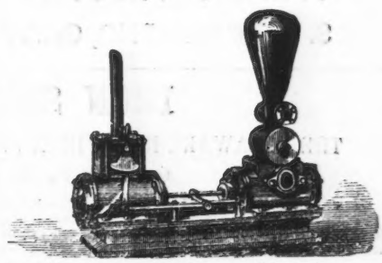
Steam Pumping Engines, Single and Duplex Worthington's Patent, for all purposes, such as Water Works Engines, Condensing or Non-condensing; Air and Circulating Pumps, for Marine Engines; Blowing Engines; Vacuum Pumps, Stationary and Portable Steam Fire Engines; Boiler Feed Pumps, Wrecking Pumps,

**MINING PUMPS.**



Water Meters, Oil Meters; Water Pressure Engines. Steam and Gas Pipes, Valves, fittings, etc. Iron and Brass Castings.
Send for Circular.
H. R. WORTHINGTON,
Jan. 2-1y 239 Broadway, New York.

**Niagara Steam Pump Works.**



This Pump has taken the first premium at every Fair in the United States where there has been a practical test.

CHARLES B. HARDICK,
**No. 23 ADAMS STREET, BROOKLYN, N. Y.,**
Sole Manufacturer of
HARDICK'S PATENT DOUBLE-ACTING
STEAM PUMPS AND FIRE ENGINES,
Patented in England, Belgium, and France. Send for circular.

## "GIFFARD'S INJECTOR" BOILER FEEDER—Sellers' New Improvements.

### New Patterns, Simple, Effective.

| No. 2. | No. 3. | No. 4. | No. 5. | No. 6. | No. 7. | No. 8. | No. 10. |
|---|---|---|---|---|---|---|---|
| 10 H. P. | 25 H. P. | 45 H. P. | 70 H. P. | 100 H. P. | 140 H. P. | 190 H. P. | 275 H. P. |
| $18. | $25. | $35. | $45. | $55. | $65. | $75. | $95. |

WM. SELLERS & CO., Philadelphia.

Send for circular giving particulars.

New York Office, 93 Liberty Street.

## "The Colorado Springs Mining Agency," Colorado Territory,

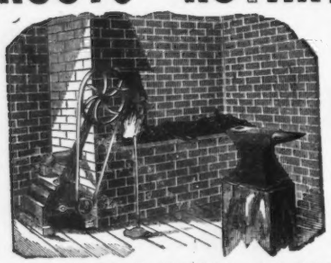
Have now in hand for Sale the following Properties, with a number of smaller price, ranging from $10,000 down. Daily additions made to the list:

| NAME. | LOCALITY. | ASSAYS. | PRICE. |
|---|---|---|---|
| **Silver Wing,** covering a group of 10 lodes | Eureka District, San Juan | $130 to $2,800 Silver per ton. | $1,000,000 |
| **Humboldt and Virginia** | Hardscrabble, | $300 to $2,200 Silver. | 250 000 |
| **La Santa La Saria** | Grand Island District, Boulder Co | $300 to $2,000 Silver. | 200 000 |
| **"Fourth of July"** | " " " " " | 65 feet wide. | 100,000 |
| **Osceola** | Sunshine, Gold Hill District | $625 to $5,000 Gold. | 100,000 |
| **Gertrude and Legal Tender** | Mount Lincoln | $300 to $3,000 Silver. | 25,000 |
| **Grand View Tunnel and Mill Site** | Sunshine | | 25,000 |
| **Union** | Sunshine | $100 to $600 Gold. | 25,000 |
| **Panic** | Grand Island District | $80 to $400 Silver. | 12,000 |
| **Harrington** | Mount Lincoln | $40 to $5,000 Gold and Silver. | 10,000 |
| **Northern Light** | " " | $25 to $1,500 Silver. | 10,000 |
| **Peerless** | Sunshine | $80 to $600 Gold. | 10,000 |
| **Thiers** | Horseshoe District, Park Co | $150 to $272 Silver—19 per cent. Copper. | 20,000 |

SEND FOR PARTICULARS.

ADDRESS:
EDWARD COPLEY, *MANAGER,*
Colorado Springs.

## ROOTS' ROTARY HAND BLOWER.



FOR ALL KINDS OF

## BLACKSMITHING.

DOES MORE AND

## BETTER WORK,

SAVES ROOM, LABOR, AND COAL, AND LASTS

## TEN TIMES LONGER THAN BELLOWS.

P. H. & F. M. ROOTS, Manuf'rs, CONNERSVILLE, IND.

S. S. TOWNSEND, Gen'l Ag't, 31 Liberty St., NEW YORK.

## IRON SHIP-BUILDING.

THE DELAWARE RIVER IRON SHIP-BUILDING AND ENGINE WORKS,
CHESTER, DELAWARE CO., PA.,

Situated on the Delaware River, fourteen miles below Philadelphia, contains twenty-three acres, with a river front of twelve hundred feet. Is completely equipped for building Iron or Wooden Vessels, Engines, Boilers, Propeller Wheels, and Machinery of every description. Address all communications to

"THE DELAWARE RIVER IRON SHIP-BUILDING AND ENGINE WORKS," CHESTER, PA.

JOHN ROACH, Pres. WM. PARKER, Treas. JOHN B. ROACH, Jr., Sec.
WM. ROWLAND, Supt. of Joiner Department.

## "BURDEN'S BEST" IRON.

### BURDEN'S "H. B. & S."

*A FULL ASSORTMENT OF THESE SUPERIOR BRANDS OF AMERICAN IRON, IN LOTS TO SUIT.*

FOR SALE BY

WETMORE & CO.,
363, 365 and 367 Greenwich Street, New York.

## THE IRON-MASTERS' LABORATORY.

**Exclusively for the Analysis of Ores of Iron, Pig and Manufactured Iron, Steels, Limestone, Clays, Slags and Coal for Practical Metallurgical Purposes.**
**No. 339 Walnut Street, Philadelphia.**
**J. BLODGET BRITTON.**

This Laboratory was established in 1866, at the instance of a number of practical Ironmasters, expressly to afford prompt and reliable information upon the chemical composition of the substances above mentioned, for smelting and refining purposes. The object being to make it at once a convenient, practically useful, and comparatively inexpensive adjunct to the Furnace, Forge and Rolling Mill.

CHARGES TO IRON WORKS.

For determining the per cent. of pure Iron in an ordinary Ore..... $4 00
For the per cent. of Pure Iron, Sulphur and Phosphorus in do..... 12 50
For each additional constituent of usual occurrence..... 1 50
For those of unusual occurrence or difficult to determine, the charge must necessarily depend upon circumstances.
For determining the per cent. of Sulphur and Phosphorus in Iron or Steel..... 14 00
For each additional constituent of usual occurrence... 6 00
For the per cent. of Carbonate of Lime, and insoluble Silicious Matter in a Limestone..... 10 00
For each additional constituent..... 2 00
For the per cent. of Water, Volatile Combustible Matter, fixed Carbon, and Ash in Coal..... 12 50
For determining the constituents of a Clay, Slag, Coke, or of an Ash of Coal, the charges will correspond with those for the constituents of an ore.
For a written opinion or letter of instruction the charge must necessarily depend upon circumstances.
Printed instructions for obtaining proper average samples for analysis furnished upon application.

### IRON AND COAL PROPERTIES.

**Examined and Reported upon for Practical Purposes, by Experienced and Thoroughly Competent Mining Engineers and Experts.**

## RIEHLÉ BROS.,

650 NORTH NINTH ST., PHILADEPHIA.
NEW YORK, 93 Liberty St.: PITTSBURGH STORE, 285 Liberty St.

## SCALES.

New Style Testing Machines.

The Celebrated Stock House Scale—all sizes. Iron Lever Railroad Track Scales. Patented First Power Lever Wagon Scale—for Coal Dealers. Parallel Crane Beams and Mortising Machines. Hydraulic Jacks.

BUY ONLY

*THE BEST AND MOST ACCURATE,*

## HOWE'S

## SCALES.

### Miners', Coal and Rail Road Track SCALES,

*OF THE MOST IMPROVED STYLES.*

PAGE & CO.,
3 Park Place, New York.

## "DEAD STROKE" POWER HAMMER.

IMPROVED ADJUSTABLE CRANK PIN.
STRIKES BLOW HEAVY OR LIGHT, FAST OR SLOW.
Prices Reduced Jan. 1st, 1875.
The Hull & Belden Company, Danbury, Ct.

## A Metallurgical Engineer,

Experienced in the construction and management of metallurgic works, and about to make a long stay in Europe, is prepared to EXAMINE AND REPORT ON EUROPEAN PRACTICE, *to bring American processes to the notice of European Manufacturers, and* to execute similar commissions.

Address "METALLURGIST," care of this Journal, before August 9th.

# THE ENGINEERING AND MINING JOURNAL.

RICHARD P. ROTHWELL, C. E., M. E.
ROSSITER W. RAYMOND, Ph. D. } Editors.

NOTE.—Communications relative to the editorial management should be addressed to Mr. ROTHWELL. The articles written by Mr. Raymond will be signed with a star.


CONTENTS.


EDITORIALS:
The Development of the Engineering and Mining Journal ... 25
The Lessons of the Strike ... 25
Investments of Coal Lands ... 25
New Publications ... 26
CORRESPONDENCE:
Mining Notes from Kanawha ... 26
Massachusetts Silver-Lead Mines ... 26
Blast-Furnace Practice in Scotland ... 26
Mining Notes from the North Shore of Lake Superior ... 28
Influence of Silicon, Sulphur, Phosphorus and Manganese on the Qualities of Iron 28
Shale-Gas and Gasoline ... 29
Wonderful Retention of Heat ... 30
Coalfields of Puget Sound ... 30
Origin of Coal ... 31
The Recent Failures in England ... 32
The Benefits of Arbitration to English Ironworkers ... 32
Notes ... 33
STATISTICS OF COAL PRODUCTION ... 33
COAL TRADE REVIEW ... 34
The British Coal and Iron Trades ... 36
IRON MARKET REVIEW ... 37
Metals ... 38
FINANCIAL:
New York Stocks ... 38
Philadelphia Stocks ... 38
Gold and Silver Stocks ... 39
Advertisements ... 39


## The Development of the Engineering and Mining Journal.

IT is with great pleasure we are enabled already in this issue to announce some of the improvements promised in our last week's number. Having acquired the *Coal and Iron Record*, well known as one of the leading coal and iron papers of this city, we have made an important addition to our subscription and advertising lists. We also add four pages more to the JOURNAL, making it now twenty-four pages in the regular edition, with frequent supplements. Our contributors, by this purchase, obtain a wider circle of readers; our subscribers a larger paper and, consequently, a larger amount of reading matter, while our advertising patrons are large gainers, securing in one paper all the advantages offered by advertisements in two separate papers, although, for the present, we shall make no increase in our rates.

The ENGINEERING AND MINING JOURNAL has long been recognized as standing far in advance of all other Coal, Iron, and Mining Journals in America, both in the extent of its circulation and the value of its contents; this addition of the business of another paper of extensive circulation makes our pre-eminence still more marked. We desire only to call the attention of manufacturers, dealers and consumers of machinery, mine and furnace supplies, coal, etc., gas works engineers, mining engineers, and all having first-class goods to sell, or who need such, to the fact that this Journal offers advantages to advertisers such as are not possessed by any other periodical devoted to these interests. Mr. BENJ. R. WESTERN, the proprietor of the late *Coal and Iron Record*, and who is so well known to the Coal and Iron Trades, enters the service of the ENGINEERING AND MINING JOURNAL, and will devote his time and attention exclusively to its interests. We have made arrangements with the following gentlemen, to act as our agents in their respective cities. They will receive orders for advertisements and subscriptions, and will be pleased to give all desired information on these subjects. B. BLOMFIELD, 30 North Fifth St., Philadelphia, Pa.; C. Mc F. REED, 122 Fifth Avenue, Pittsburgh, Pa.; WM. H. NEWCOMB, 112 State St., Boston, Mass.

## The Lessons of the Strike.

THE end of the great strike of the anthracite miners is a subject for sincere congratulation by all who are interested, as producers or consumers, in the coal trade. The strike was one of the most obstinate that has ever taken place in this country, and though the men were better prepared than ever before to undertake it, it still entailed on them an immense amount of suffering and a loss that three years' steady work cannot repair. Those who had the savings of years of frugal industry laid by in savings banks or invested in a home, have lost the former and seriously encumbered, if not forfeited, the latter. The means of the industrious and saving have been taken to support the idle and improvident, who having nothing laid by could lose nothing, so long as their comrades were willing to provide them the means of living. There has scarcely been a day since the strike began where the great majority of the men, especially of the industrious and thrifty, who were "laying by" money, would not have been willing to accept the operators' terms had they not been deterred from doing so by the violent element which originates and organizes strikes. The companies have gained a complete victory, but, as was said of another "glorious battle," a few more such victories would be ruinous. Have not both sides learned something by the strike, and can they not devise some system of arbitration for the settlement of difficulties which will inevitably occur from time to time between them?

At the commencement of the war, when announcing the reduction in wages, the Lehigh operators, with curious inconsistency, "*Resolved*, That when work at the mines is resumed, it shall be with the distinct understanding that if any difficulty as to wages, or of any other nature, shall arise between the operator and any of his employees, which cannot be arranged by the parties interested, that the difficulty shall be referred to a board of arbitration for settlement, and pending the decision, work shall not cease on account of said difficulty."

Why this rule was not just as applicable to the last "difficulty" as to those that will come in the future we cannot say, but it is a notable fact that neither the operators nor the men, at any time during these six unhappy months of strike, ever proposed to leave the settlement to arbitration. The fact is the more remarkable because, on a former occasion, a strike was ended to the satisfaction of all parties by the decision of an umpire! It is not when war has been declared and bitter feelings aroused, that conciliation and arbitration are most likely to succeed. Let the leaders of our great coal Combination now invite their employees, individually, not as a Union, to join in such an agreement as that above quoted. In no other way can the ill advice and influence of evil counsellors be so successfully defeated and the rights and true interests of both the men and their employers be protected. The strike has been an expensive lesson to both sides, and it would indeed be sad were its teachings to be ignored, and the relations between employers and employed to continue to be governed only by the laws of force which have produced such unsatisfactory results in the past. The suggestion, nay, we may now say, in the hour of victory, the establishment, of the principle of arbitration must come from the heads of the great companies; and to whom should we look for the adoption of a great reform, if not to the enlightened and well informed?

## Investments in Coal Lands.

THE effect of our financial storm of 1873 was, and is, to make capital unwilling to invest in any enterprise not offering the utmost security, and as mining investments have the reputation of being "speculative" in a high degree, they have received but little attention during the past year; yet, a little reflection will satisfy anyone that our mining securities have suffered less by the panic than any other class of investments we have.

We are far from desiring a recurrence of the reign of the petroleum fever, or of the wild investments in coal mines which took place about the close of the war, at which time fabulous profits were made on coal, and anything bearing the name of a coal mine could be floated in this city or in Boston with a capital that had no necessary relation to the value of the property. Many of these mines, though intrinsically valuable, were yet ruinous investments, either because they were purchased at prices far above their value, or because they were mismanaged to an extent that would ruin any enterprise; in not a few cases these causes were combined, and the usual result was a total loss of the investment. The fact, however, remains, that there is no investment in this country to-day that offers such an absolute certainty of large profits, with a security unequalled in any other class of enterprise, as we have in our mineral lands in various parts of the country. Notwithstanding the depression in trade, last year, which curtailed the production of anthracite coal about one million tons, and of bituminous coal in a few States, the great increase in production in other States more than compensated these reductions; and, as we stated in the JOURNAL last week, our total production amounted to 50,747,175 net tons, which was, probably, a considerable increase over the production of any previous year. With returning prosperity, our coal trade will progress rapidly and continuously, and the value of coal lands will appreciate in value to a degree that is certainly but little understood or anticipated by the majority of our capitalists to-day. Even during the past year, well selected coal lands, so far from having fallen in value, have improved, and prices have been paid within a few months for anthracite lands in the Wyoming Valley, that they would never before have brought. True, these are very valuable lands, worth to-day from $800 to $1,100 an acre, and the interest on such a price would soon make the investments extremely onerous, except where they were yielding a revenue from mines; but there are lands of almost equal prospective and intrinsic value in many other parts of the country, that can be purchased for from ten to three hundred dollars an acre. In Alabama excellent coal property, containing, say, thirty feet of good coal in veins from two to ten feet in thickness—some of the beds yielding a coal that has no superior in this country for coking purposes, and others an excellent steam and house coal—within a few miles of the most magnificent deposits of hematite ore and of rail transportation; the land heavily timbered with oak, yellow pine, etc., can be purchased at from $3 to $5 per acre. Yet, from its natural advantages, this portion of the country cannot fail to become, at no very distant day, a great mining and iron making center, when lands will be worth many times their present value.

In Tennessee, Kentucky, and West Virginia, we have property that can be purchased at from $1 to $10 an acre, that possesses not only an inexhaustible treasure in its coal and iron ore beds, but which for its timber, and, in some cases, for agricultural purposes—considering its nearness to market, the richness of its soil and its fine healthy climate—is superior to much of the Western Railroad and Government land that sells at even higher prices than this, and yet possesses none o fits rich minerals. In West Virginia, on the Kanawha and on the line of the Baltimore and Ohio Railroad, lands immediately available for mining purposes can be obtained at from $20 to $100 an acre, and on the Youghiogheny, in the very center of the famous gas coal and coke district, lands can be bought at from $50 to $150 an acre, which, though they contain but one available bed of coal, cannot but be worth, in a few years, many times what is now asked for them.

With the exercise of care in the selection of coal and iron ore lands in these and many other districts, the capitalist cannot possibly fail to obtain enormous returns on his investment, while no real estate in this city can give him more perfect security. It is true, the value of land in Alabama has not generally increased much, if any, in late years, but neither has it depreciated, while in the

Kanawha, the Piedmont, and Youghiogheny Districts—in a word, wherever mining operations may be commenced now, or in the near future—the value of coal lands is rapidly rising and must continue to increase. They offer to the capitalist a perfect security and a certainty of profit that will be measured, not by five or six per cent., but by twenty, thirty or forty per cent. a year on his investment.

*Perfect security and large profits* are the capitalist's dream of the financial millenium. We commend an investigation of coal and iron property as an investment to those who are now overflowing our banks with their unemployed money. But we add a word of warning—mining investments, though offering profits greater than can be obtained in any other business, should be made only after the most careful investigation. In the first place, the actual existence, quantity and quality of the mineral should be known, and also the facilities offered for economical mining; the accessibility of the mineral to market and its net value there; and a thorough and impartial comparison of these several items with the corresponding ones of similar mineral from other property. It is not sufficient that a property should have, for example, a large bed of coal, easily mined, and of good quality, if for an equal price the same coal can be procured on other property nearer to market, or possessing greater advantages in some other respect. It is always a question of relative value, of comparison, and whether the investor proposes holding the property, without working, for a number of years or not; these several questions, and many others, should be fully investigated before purchasing. The prospect of enormous profits which mining investments offer is so dazzling that even careful business men seem to lose their judgment, and invest in this class of securities in a manner so injudicious and wild, that it would bring sure ruin in any other business. That it sometimes bears the same fruit in mining is certainly not surprising, while the exercise of the same prudence that is exercised in other industrial investments would make those in mining the most popular, as they are certainly the most profitable, in which capital can seek employment.

## NEW PUBLICATIONS.

THE GEOLOGICAL STORY BRIEFLY TOLD: By JAMES L. DANA, LL.D., etc. Published by IVISON, BLAKEMAN, TAYLOR & Co., New York, 1875.

Professor DANA's ability as a geologist needs no mention here. The present and latest of his books is, as its name indicates, a popular treatise on Geology. This wonderful story, though the oldest on record, is always new, and when clearly and simply told, as it is in this little book, cannot but interest all who read it. The chief fault in books which endeavor to popularize science is that accuracy is often sacrificed to a desire to make a more entertaining story. On one hand, the writers have only a general, and usually a superficial, knowledge of their subjects, while, on the other hand, the scientists not unfrequently fill their books with technicalities, details, and abstractions, that effectually prevent the general unscientific public from taking any interest in the subject. Professor DANA has succeeded very fairly in avoiding these difficulties, and his little book will probably do more towards the general diffusion of geological knowledge than his more elaborate works or those of other writers have done.

It is well known that Professor DANA is not a follower of DARWIN, but he is a student too honest and clear-sighted long to hold out against the great mass of independent, corroborative evidence which is being accumulated in support of DARWIN's views, and we shall not be surprised to find him, before long, among the large number of distinguished converts to the new faith.

## CORRESPONDENCE.

### Mining Notes from the Kanawha.

From Our Special Correspondent.

TO THE EDITOR—SIR: The River Mines are all looking with much interest for the plans of the government work on the river, which promises to give slack-water navigation for about nine miles from Cat Fish to Paint Creek Shoals. The SUPPLLY COAL Co. and the KANAWHA SEMI-CANNEL COAL Co. are both preparing to load at the river, though the former has now only about 20 inches at low-water, and the latter will have to dredge.

STUART M. BUCK & Co. are building an extension of their plane to the river, which will be available during the seasons of low-water and ice, when navigation is closed on the Ohio. There is no good holding water at Huntington, so that they have to stop all work for the Cincinnati market when navigation ceases, unless they load and hold in the Kanawha. The market is very much depressed, and when I had my last advices from Cincinnati, June 28th, it was impossible to sell coal at any thing like a fair rate, as coal men hoped to receive some of the sixteen million bushels now loaded at Pittsburgh.

The GAULEY KANAWHA Co. have the rails laid and the engine running on their branch road; they have also driven 150 feet on the cannel seam, and the timber work of the incline to that seam is well advanced. Professor ANSTEAD is expected out next month.

### Massachusetts Silver-Lead Mines.

NEWBURYPORT, Mass., July 6, 1875.

TO THE EDITOR: SIR—I have thought that some account of the present stage of silver mining in Massachusetts might not be devoid of interest to your readers.

Our "mining region," thus far, appears to extend from Gloucester, Mass., on the South, to Portsmouth, N. H., on the North, and from the Atlantic as its eastern bound, to a line drawn north and south through "Great Pond," North Andover, Mass., on the West. Within this region, the first discovered, and thus far most prominent, lode is the "Chipman," which lays in the northerly part of Newburyport, and has been traced some three miles. The dip is nearly vertical, slightly to the North. Strike 20° north of east. The ore of this lode is chiefly galena, carrying from 50 to 150 ounces silver per ton, with some gold, blende, copper and pyrites. Native silver occurs in the quartz, and stephanite has been found. The Chipman and Boynton shafts are on this lode; the Boynton is now down some 105 feet. About 100 feet east of the Boynton shaft is the Chipman, which commenced by striking an ore body, taking out $20,000 of galena ore, in sinking the first 75 feet. Still further east, some 900 feet, a crosscut has just uncovered the lode again, showing 26 inches of fine galena ore, assaying 95 oz. silver per ton. The average thickness of vein rock on the Chipman Lode is about 60 feet. This lode lays between granite on the north, and slate on the south. There are not less than eleven parallel veins in this section of our mining district, parallel to the Chipman, on several of which operations have commenced, showing well in a majority of cases.

Next, a second variety of ore comes to notice, the veins carrying tetrahedrite, which often runs exceedingly rich in silver. The most prominent of these, at this time, is the "Bartlett," which has an outcrop of vein rock (limestone) something near 100 feet thick. The ore in this vein is coming in very thick, and gives from 200 to 1,100 ounces silver per ton, and 30 per cent. copper. There are several of these "gray copper" veins known, from one of which I obtained as average of rock, 75·9 oz. silver per ton. These veins lay in contact with porphyry. A third class of veins lay between the galena veins on the North and the porphyry at the South. They carry both galena and gray copper, but have not been sufficiently investigated to warrant an opinion. Auriferous quartz exists here, but is yet unworked.

CHARLES W. KEMPTON, Mining Engineer.

### Blast-Furnace Practice in Scotland.

From our Special Correspondent.

THOSE who are accustomed to think of the Scotch people as the embodied representatives of all the prudent and saving virtues would have their opinions somewhat modified were they to visit many of the iron making establishments in this neighborhood and see in them the wasteful use of the raw materials in connection with the defective apparatus. This condition of affairs serves better, however, to point the moral that "plenty makes waste;" for, until recently, the supply of coal and ore has been so abundant that there has been no incentive to rigid economy in their use.

True it is that, when NEILSON made the discovery that by the use of hot blast a ton or more could be made with three, instead of eight, tons of coal, the Scotch iron masters were not slow to adopt the improvement; but when it was only a question of a few hundred-weight more or less, the subject had but little interest to them. I say *had* but little interest, because, about two years ago, when coal cost $5 00, instead of $1 25, as formerly, they did begin to see that economy in fuel was a thing they might have to carefully consider in the future. Some of the results of this awakening are very plainly visible to one returning here after an absence of four or five years.

One of the first to inaugurate a change in the blast-furnace appliances then in general use, was Mr. WM. FERRIE, the well-known inventor of the self-coking ovens that bear his name.

Shortly after him, other managers commenced trying experiments on the effect of raising the heights of their furnaces from the then almost universal standard of 50 feet to as high as 75 or 80 feet. A few of the furnaces were also fitted up with arrangements for collecting the waste gases which had hitherto been allowed to burn at the tunnel head. In one respect, however, the Scotch blast-furnaces have been well supplied for many years. The blast engines, which are almost universally constructed after the beam condensing model of WATT, have stood the test of experience in an admirable manner.

The question which often has to be carefully considered in the United States, whether to carry the coal or the ore to the furnaces is one that does not perplex the iron master here, for nature has so disposed of her stores that both materials are often taken from the same mine. The famous blackband ore, the discovery of which is due to MUSHET, fortunately contains bituminous matter enough to render itself calcining. Unfortunately, however, this material is becoming quite scarce, and, unless discoveries of new deposits are soon made, it will cease to play an important part in Scotch iron making. With wise forethought, the BAIRDS, of Glasgow, secured some years ago much land containing this ore, which in future will give them a great advantage over less fortunate iron makers.

The total number of Scotch blast-furnaces at present is 157, which are contained within a strip of country 30 miles wide and 75 miles long, lying between the lower part of the Frith of Clyde and the Frith of Forth. Nearly half of these, however, including those where the celebrated Coltness and Gartsherrie brands of iron are made, are within fifteen miles to the southeast of Glasgow. Coatbridge, where the Gartsherrie furnaces are located, is also the center of the Scotch malleable iron trade. Thirty-five of the 157 furnaces are at present out of blast, most of them, however, from need of repair or alteration. The reason for this apparent activity is not very plain, for the condition of the iron market here is at present *anything but a satisfactory one.*

A remarkable opinion has, until quite recently, been held by the various companies as to the best dimensions to be used in constructing their furnaces. More than half of them are 50 feet high, and the larger part of the remainder are but a few feet more or less. Almost without exception they are built with cupola stacks, supported on brick arches; some of these have the casing made of cut sandstone blocks, while in others large fire bricks are used for the same purpose. To resist the outward pressure of the walls, horizontal iron hoops, breaking joints with the courses of the casing, are most frequently to be seen. All but thirteen of the furnaces in the district are made with open tops, and at these, with the exception of four at the Summerlee Works, no attempt is made to secure any of the waste gases. In making linings and hearths, nothing but the largest kind of fire bricks are used, some of them having dimensions as great as 3′x1½′x1′. Many of the furnace companies make their own brick, the clay for which they obtain from their collieries. These large bricks are of excellent quality, being hard, free from cracks, and sonorous when struck. The most celebrated brand, called the Glenboig, has, when baked, an appearance something like Scotch granite; but although highly tinged with oxide of iron, it has shown remarkable fire-resisting qualities in practice.

The diameters of the furnaces at the boshes vary from fifteen to eighteen feet; the most common dimension being sixteen feet. The hearths are from five to eight feet in diameter, the stope of the boshes commencing at a height of from one to three feet above the tuyeres.

The tuyeres which are usually 2½ feet from the hearth bottom, vary in number, according to the ideas of the various managers, from 4 to 10.

Owing to the nature of the ore and fuel, there is a constant tendency to

choking up in the lower parts of the furnaces, and as a consequence, large fore hearths are used, and at the Dalmellington Works, three of the furnaces are fitted up with both fore and back hearths. It has been found, however, that although this arrangement increases the yield of iron, the quality is not improved.

The cast iron coil tuyere, of only about one foot in length, seems to be most in favor. But little can be said in praise of most of the hot-blast stoves, for, as a rule, they are small, badly constructed, and heated with coal fires. Each stove is generally connected with one or more of the tuyeres independently of the rest. Flat pistol pipes are used in most of the stoves and the blast is seldom heated above 700° F. Where the furnaces are not located by side hills, direct winding engines are used to hoist the charges. As has been stated, beam blowing engines are about the only type used in the district, and many of them, which have been in operation for twenty years or more, are admirable examples of the durability of this class of engines. Some of these are built without any fly wheels, and have a valve motion that makes a clatter in working that is only rivalled by a horse shoe machine or a room full of nail cutters.

At the Govan Iron Works, in Glasgow, there is a pair of blowing engines of quite peculiar construction. They are built on the vertical direct acting plan, and on short examination, look like many of the American rolling mill engines, no blowing cylinders being in sight. When looked at more closely, it is seen that there are four piston rods from the steam cylinder, which are keyed into a four armed crosshead, in which the fly wheel connecting rod works. From this same crosshead, four more piston rods go down through the bed plate of the engine, and work the piston in the blowing cylinder which is below and out of sight. The advantages claimed for these engines are great stability and compactness; but the disadvantage of having eight stuffing boxes for the piston rods instead of two, as in ordinary engines, seems to more than counterbalance these improvements. Most of the boilers are large horizontal cylinders, with two flues running through them, in which the fire grates are placed. By using the Galloway tube in these, their steam generating power is much increased. To secure strong and abundant draught, every furnace plant is provided with one or more brick chimneys, from 125 to 200 ft. in height, to which all the boilers and hot blast stoves are connected.

Mr. WM. FERRIE, Manager of the Monkland Iron Works, conceived the idea, a few years ago, that, by using the waste gases of the furnace to coke the coal used, a much smaller amount would be necessary to smelt the iron. To make the explanation of the apparatus he has invented to accomplish this result, clear to the reader, it must be understood that the Scotch coal is of the non-coking or splint variety, and consequently, the furnaces are fed with raw coal. Now, as a large amount of the heat that is generated at the tuyeres, is absorbed by driving off the bituminous matter in the coal, and as much inflammable gas is given off at the throat, Mr. FERRIE thought that by putting a coke oven on top of the furnace, and heating it with some of these waste gases, the result would be a beneficial one. His ovens which appear externally like an addition of about 40 ft. in height to the ordinary furnace, are commenced by springing two fire brick arches at right angles to each other, over the furnace throat. On these arches vertical walls, traversed by horizontal flues, are built to the full height of the oven. The circular walls of the furnace are continued upward to form the sides of the oven, but instead of being built solid they are made with annular flues and passages which are connected with those in the division walls just described. The top of the oven is closed with an ordinary cup and cone charger. Described as a whole, the oven is simply the upper part of a high closed-top furnace, divided into four coking chambers.

The operation of the furnace is as follows: A small portion of the waste gases are carried down from the top of the oven through some of the outside flues to the lower flues in the division walls. Air is there admitted through doors made in the casing, and the ignited gas passes in a zigzag course all around the chambers, till it reaches the top of the oven. By this means the walls are kept at a red heat, and the coal is thoroughly coked, and the limestone calcined before it has reached the furnace proper. What remains of the waste gases, is taken off through ordinary down comers, and is used to fire the boilers and hot blast stoves. There is such a great amount of this gas that it is not only sufficient to do this, but enough is left to work a reheating furnace to which purpose it is shortly to be applied.

The coal that is used at the Monkland Works is highly bituminous and consequently makes a gas rich in tarry matter. It would naturally be supposed that this tar would condense and collect in the down comers and gas pipes, but Mr. FERRIE says, the only deposit which is formed is a brown dust, not at all liquid, and easily removed. Where, however, the gas leaks out of the pipes into the air, the tar condenses and drops down. Much of the dust is deposited in the lower end of the downcomer, which has to be cleaned out every two weeks.

The saving of fuel in the furnaces provided with these ovens has been a very marked one. Whereas it formerly took from 50 to 55 cwt. of coal to make a ton of iron, only from 35 to 40 cwt. is now found necessary. Then, too, nearly a ton of fine slack coal per ton of iron made had formerly to be used under the boilers and hot-blast stoves which are now supplied with the waste gases. To convince his neighbors of the genuineness of these results, Mr. FERRIE allowed the Coltness Company to send a gang of men to his works, who took entire charge of one of the self-coking furnaces. They also sent their own ore, coal, etc., which was weighed and put into the furnace.

At the Coltness Works, one of their 50-foot furnaces was operated with identically the same kind and quantity of materials by Coltness workmen, but under the supervision of a man appointed by Mr. FERRIE. After three weeks' trial, the iron which had been made in each furnace was carefully weighed, sampled, and a portion converted into wrought iron and tested for strength and quality. The iron in both cases was found to be equally good, but the Ferrie furnace had used 18 cwt. less of coal per ton of iron *than the one at Coltness*. There are six of these furnaces at the Monkland Works, two of which, 85 feet high, including the ovens, have been erected and blown in quite lately.

At the Dalmellington Iron Works, in the Scotch Ayrshire district, one of their furnaces has been using a Ferrie oven for over a year. The principal objection that is urged against these ovens is that the vertical cross walls and the comparatively thin linings may wear out sooner than the furnace itself. Should this be found to be so, it will be nearly impossible to make necessary repairs without blowing out the furnace.

Several other managers, particularly those at the Govan, Wishaw, and Summerlee works, have been trying the experiment of raising the height of some of their furnaces from 50 to 80 and 85 feet, and also providing them with closed tops. By making this change they hoped to save a considerable quantity of fuel, both in the furnaces and at the boilers and hot-blast stoves. The prophecy that some made, that these furnaces would choke up in the hearth and work irregularly, has not been fulfilled. The Govan Company claim, that by the use of their high furnaces they have effected a saving of 15 cwt. of coal per ton of iron over that previously obtained in the low open-top furnaces, besides getting gas enough from one stack to supply the boilers and hot-blast stoves for two furnaces.

At the Summerlee Works, where the gas is taken off from 4 open and one closed-top furnace, they have such an abundant supply that in an old furnace, which is being raised to a height of 80 feet, there is no arrangement made for taking off the gas, for the simple reason that it is not needed.

The saving of coal at the Summerlee and Wishaw works in their 80-foot furnaces amounts to about 12 cwt. of coal per ton of iron. They also find that there is an increase of nearly 20 per cent. in the weekly yield. The coal used at the Wishaw Works is quite rich in bituminous matter, and there is a daily collection of from 40 to 50 gallons of thick tar in a branch pipe from the downcomer, which is drawn off every day. Except in this place no tar of any amount is formed, the other gas pipes and valves having been cleaned out but once since the furnace started, eighteen months ago. The Govan Company use a dry coal and have no accumulation of tar whatever, either in flues or gas valves. They feel so much encouraged with the results they have obtained at both these works, that they are going to change all their old furnaces to high closed-top ones as fast as they are blown out. The Glengarnock Company have altered two of their furnaces in the same way, but what results they have obtained I do not know.

The coal used in the Scotch furnaces is found underlying the whole district over which they are scattered. The seams, although in no cases very thick, are quite numerous and easily worked. But a small quantity of the coal that is found is susceptible of being made into coke, and this, which is of rather inferior quality, is used for cupola purposes in re-melting iron. Several seams of cannel or gas coal are also worked. The present cost of iron-making coal is from $1 00 to $1 75 per ton. The blackband ironstone, which a few years ago was almost the only ore used, is found in narrow seams through the coal bearing measures. It much resembles in appearance the brown, pitchy shales found near our soft coal seams, and is easily mined without the use of powder. The process of calcination is carried on in open heaps, the ore containing enough bituminous matter to supply its own fuel. After being burned, the ore contains from 50 to 60 per cent. of iron. Now that this blackband has become so scarce many of the furnaces are using from one-half to three-quarters of calcined clayband ore, of which there is yet an abundant supply. For the past seven or eight years, the iron masters have been in the habit of using from 2 to 3 cwt. of rich hematite ore from the Cumberland District per ton of iron, which they find both increases the yield and improves the strength of the product. Limestone of good quality is quite abundant, and in most cases is found near the furnaces.

The fine fluid qualities of the No. 1 Scotch iron, when used for foundry purposes, is so well known all over the world, and particularly in the United States, that it is not necessary to say much under this head. Mixed with English iron it makes good puddled bars. The Monkland Iron Works have long been celebrated for their nail rods and at Coatbridge there is an extensive manufactory of sheet for tin plate.

One very striking feature in connection with the Scotch furnaces is the cheap character and small amount of the labor that is employed to work them. The furnaces of the ordinary size, that produce about 30 tons of iron a day, only have four men to work them. Two of these attend to the hearth, tuyeres, pig moulds, etc., and the other two do both the top and bottom filling. A fifth man attends to the firing of the hot-blast stoves. To stoke the boilers, about ½ a man to each furnace is needed. Those who are accustomed to American practice may say that it is impossible to do the work with so few men, but the secret lies in having Irish labor and Scotch foremen. When it is known that the furnaces have to be worked twice every turn, the amount of exertion these men have to put forth can be appreciated. The wages the keepers receive vary at present from $1 50 to $2 25 per day, and the other men get from $1 to $1 25.

The way in which the iron is sold is somewhat peculiar. In Glasgow there is a large stock yard called Connal's Stores, to which much of the iron made by the various companies is brought. For this iron the Connal firm issue warrants and these are sold in market in the same manner as ordinary stock shares. By this method the selling price of the different brands is made a matter of entire publicity. The Messrs. BAIRD, owing to the large number of furnaces, mines and collieries, they own, are able to control the special price of the iron from week to week. Their brands, Gartsherrie and Eglinton, however, do not bring as much by $1 a ton, as that made by the Coltness Co.

The largest production of iron in the Scotch district for any one year was in 1870, when 1,206,000 tons were made. Last year but 806,000 tons were produced. The decrease in the shipment of iron to the United States has been very great since 1872. In that year 141,843 tons were sent as against 36,467 tons in 1874. That the American market still needs some coaxing is shown by the fact that, although the best brands can be bought here for from 17 to 18 dolls. gold, per ton, the delivery of which on the docks at New York is undertaken by the S. S. companies at the extraordinary low rate of 25c., a large order at these figures was recently countermanded by a New York broker who was afraid of a still lower market.

* * * * * * * * * * *

Before taking leave of Scotland, one establishment, the pioneer of its kind there, deserves mention. It is called the Steel Works of Scotland, and at present is engaged in the manufacture of SIEMENS-MARTIN steel rails and forgings. They have eight furnaces completed and a number more building. Each one has a capacity of six tons at a heat, two heats being made conveniently in 24 hours. At present they are making about 80 tons of ingot a day. The steel is produced by the reaction of magnetic Spanish ore on Cumberland pig iron mixed with a small amount of steel scrap. At the termination of the operation spiegeleisen is added to recarburize. The bottoms and sides of the furnaces stand the fluxing action of the ore remarkably well, they not needing general repair oftener than every two months. The works are soon to be fitted up with rolls for making boiler plate. It is an interesting fact that the rails made here are sold at the same rates as those produced at other places by the Bessemer process.

---

**Iron for Gilding and Silvering Directly.**—The following is a method given for producing iron which will take a direct deposit of gold or silver:—To a ton of iron add 12 kilogrammes of nickle and a ¾ kilogramme of manganese. Objects formed from this iron only require to be simply washed with milk of lime, and then placed in baths composed as follows:—For gold, water 100 kilogrammes, bicarbonet of soda 800 grammes, pyrophosphate of soda 200 grammes, chloride of gold 16 grammes, cyanide of sodium 65 grammes, hydrocyanic acid 2 drops. For silver, wat r 100 kilogrammes, bicarbonate of soda 2 kilogrammes, chlorideor niter of silver 130 grammes cyanide of potassium 210 grammes, hydrocyanic acid, 10 drops.

## Mining Notes from the North Shore of Lake Superior.

CONCLUDED FROM PAGE 7.

THE Duncan Mine is one of the big stock schemes, and at the time it was put on the market, it had nothing to show for its estimated value, except the fact that they had had fine specimens of native silver, but had lost them. At one place there was a little show of silver ore, but a "horse" of dolomite was coming in and cutting it out. Developments this winter prove the silver leaders to pass behind the dolomite.

Last Fall saw this company almost without funds or hope, and stock below a dollar. It was through the courage of one gentleman that a small force was kept at work to examine into the theory of the south wall carrying the silver, which has now proved to be correct, and the yield has been so good that the company are determined to continue the work more vigorously. Mr. COURTIS, a metallurgist of experience in treating Silver Islet ores, was sent up on the opening of navigation to examine the ore and the promise of the mine for the future.

It proved that about 8 per cent. of the ore was very rich, being mostly threads of native silver in zincblende or quartz. The assay of the richest was 3,300 ounces, while the remainder, from which this was separated, assayed 108 ounces, leaving a dump assaying 18 ounces. There is every prospect that the mine would soon pay its own way with stamp mill and dressing works to take care of all classes of ore.

The vein presents many points of interest. In it are found immense vugs filled with crystals of calc-spar of all sizes, up to 100 lb., also amethystine quartz, sometimes of beautiful shades. The calc-spar is also colored slightly amethyst, and where there are decomposed spots the cavities are filled with black oxide of manganese. At Silver Islet, manganese appears to be combined as carbonate with the spar, forming a flesh colored spar which at times is rhodonite, rarely found in crystals, while at Duncan the manganese must be as peroxide merely giving the amethystine color. The vugs at Duncan are not filled with gas.

The formation of the vein appears to be as follows, starting from the north wall. A few barren leaders in the country slates filled with calc-spar, the leaders being ½ inch or so. Then a vein, 15 to 22 feet across, carrying calc-spar, amethystine quartz, barite very rare, a little zincblende and, in depth, much iron pyrites and a very little copper pyrites; the pyrites carry some combined silver. The vugs are full of crystals of spar or quartz coated with pyrites, and some fluor spar of a green color. Next to the great vein comes a "mundic slip," at times separated by slate, at others forming part of the vein. To the south of this comes broken ground full of leaders of calc-spar. The largest of these leaders is about a foot wide. In places the partings of black slate have been broken up, and mixed with the spar so as to form a breccia, the little "horses" of slate being surrounded with zincblende, carrying more or less native silver. There is one leader of quartz which carries spots of native silver mixed with sulphide. In places the silver is found on both sides of the mundic slip.

The large leader has produced the nickel ore which also seems to form on the black slate walls. It is mostly massive or large bunches of crystals of zincblende, penetrated with threads of native silver, the blende itself being rich.

These leaders appear to dip to the vein and promise to form a rich spot where they join it in depth.

At the bottom of the deepest shaft the large vein had contracted to 7 feet, and carried large quantities of pyrites and some zincblende, which also would indicate metallic deposits in depth. We know that the Huronian slates underlie this formation at no great depth, and about 10 miles from here carry veins rich in native silver and niccolite. There is a "horse" of very hard dolomite on the south wall tapering off to the west and to the surface. The calc-spar leaders pass into the country slates beyond this, and carry silver and silver minerals. At the first level this dolomite was taken for the south wall, being at least ten feet thick, so that it is not known how rich the leaders are beyond it at this depth. At the point where the dolomite gives out, or rather becomes broken up, some very rich ore was taken out on this level, but the desire to get to the north wall appears to have been so great that, although native silver is still to be seen on the south wall at this place, the drift was run to the north.

Thunder Bay Mine, about 3 miles from Duncan to the North East, has spent some money, mostly in surface improvements and in putting up a mill for washing the ore, which did not prove a success. The surface improvements were destroyed by fire. There has been some exploration underground which failed to develop any very rich ore, such as was found on the surface; it is said because the vein was missed. Mr. STEWART is to put up a mill this spring to amalgamate ore from this mine or custom work that he can get. Three A Mine, Duncan and others have contracted to let him have a large number of tons of dump material on favorable terms for him, to assist in the completion of his works. It is understood the mill is to be placed near Prince Arthur's Landing.

Three A Mine, still further up on Thunder Bay, is another enterprise killed by too much stock.

The ore is in small veins in talcose and other slates of the Huronian formation. Some few tons of very rich ore have been taken out, assaying as high as 920 oz. silver and 4½ per cent. of nickel. The vein has been explored by one or two pits, and a pinch having been met with, there is a hitch in getting money to carry on the work. There are, however, a few determined owners, who, without doubt, will eventually reap the benefit of their perseverance, and prove this to be a very valuable property.

The Canada Mining Company have a small force at work on their location, at Sturgeon Bay, hoping to develop paying ore in working quantities on a large spar vein. The Black Bay Mine Co. have had a force at work all winter, but are in some financial trouble which a pinch in the vein does not assist. I understand they have done some excellent surface work in the way of a railroad, so as to be prepared to handle the ore in large quantities. Their ore is galena, with copper pyrites and carries some silver and a little gold.

Jarvis Island and some of the other mines have stopped for the present, not having found sufficient rich ore to pay, and having no means of treating material too poor to ship.

Mr. DAWSON, Director of the Red River Route from Prince Arthur's Landing, owns a very valuable location on Pie Island and proposes to make developments upon it during the summer. The ore is very similar to the best of Silver Islet, native silver and niccolite, and without doubt will prove very rich. There are many good properties lying undeveloped for the want of capital, which the misfortune of some few adventures has driven away. The desire to make more by selling out than by working has helped evident ignorance of silver ore treatment to almost ruin a district that offers still some of the best prizes in mining risks.

The rich deposits of gold ore at the Height of [illegible] remain undeveloped, but it is expected that the summer will see an end to the difficulties in regard to title, and a force will be put to work. There are signs that some of the new discoveries will be developed before the close of the summer, and the advent of capitalists is anxiously looked for at the Landing. The old Bruce copper mine, on St. Mary's River, met with a disastrous cave, extending to the third level, early in the Spring, which willl probably prove a death blow to operations, as for some time it had not been in a flourishing condition.

Explorers are pushing their way further to the east between Neepigon and Michipicoten Bays. Already at the Pic discoveries have been made, and many are confident of still richer discoveries before many months. "EZUEST."

---

## Influence of Silicon, Sulphur, Phosphorus, and Manganese on the Qualities of Iron.

BY RICHARD AKERMAN, OF THE STOCKHOLM SCHOOL OF MINES.

CONTINUED FROM VOLUME XIX., PAGE 475.

*Phosphorus is removed in the Slag when Iron ores are incompletely reduced, as when the action of the Furnace is imperfect, or when malleable Iron is produced direct from the Ore.*—An exception to the state of things described above, that furnace slag, to be sufficiently fusible, cannot be made more basic than that its composition corresponds to the mono-silicate, is brought about by the protoxide of iron, whose occurrence in the slag so essentially increases its fusibility, that without danger of solidifying at the ordinary furnace temperatures it may be considerably more basic than under ordinary circumstances. Such slag has power also, in full correspondence with what has been stated above with reference to the behavior of phosphoric acid, in an opposite way to ordinary furnace slag, to take up and retain a very considerable amount of phosphoric acid, but from this the blast-furnace process derives no true advantage, for its object is to reduce the iron as completely as possible; and furnace slag rich in protoxide of iron is obtained only in such undesirable cases as when the furnace action is imperfect on account of incomplete reduction. On the other hand, the circumstance now referred to is advantageous for those processes by which malleable iron is produced direct from the ore, for in such processes the whole content of iron is not reduced, but a part remains in the slag, which again in this way has power to retain within itself the greater part of the phosphoric acid to be found in the ore.

To the passing of phosphoric acid into the slag, both in the case of very imperfect furnace action, and in the old direct processes for the production of iron, conduces besides not only the circumstance that the slag becomes more basic, by taking up protoxide of iron, but also the incomplete reduction which indeed is the very condition for the protoxide of iron passing into the slag. That the iron shall be the freer of phosphorus in the same proportion as the reduction is incomplete is again a consequence of the circumstance which has been often referred to: that if any phosphorus can be removed in the slag it must be as phosphoric acid; but the more reducing the process is, the more easily, naturally, is the phosphoric acid reduced, combining with the iron as phosphorus. When the reduction is promoted by raising the temperature, it ought to follow that in the same proportion a smaller portion of the phosphoric acid contained in the charge can remain in the slag the hotter the furnace is; but, if we confine ourselves to a perfect furnace action, the influence of the temperature appears to be quite unobservable. In other words, at the lowest possible temperature at which a perfect furnace action is obtained the reduction is so powerful that the whole of the phosphorus contained in the charge is reduced, and the pig iron consequently is not noticeably richer in phosphorus when the temperature of the furnace, as during the production of gray pig, is raised above the degree necessary for a perfect action.

*The power of Fluor Spar to purify from Phosphorus.*—Fluoride of calcium has, like silicates, the power when fused to take up the salts of phosphoric acid; but the behavior of these is essentially unlike; for, while in the former case silicic acid drives out or sets free the phosphoric acid, in order to seize upon the bases with which it has been combined, the salts of phosphoric acid dissolved by the fluor spar are, on the other hand, left in peace and undisturbed. The consequence of this is, that while the silicates, which form the common furnace slags, have not power to purify from phosphorus to any noticeable extent, the corresponding compounds of fluorine have, on the other hand, the power to bring about such a purification. CARON (1), for instance, has shown that when phosphate of protoxide of iron is fused in mixture with fluor spar, lime and charcoal, the metallic regulus obtained contains considerably less phosphorus than when the same phosphate is fused with lime, silica and charcoal. The iron obtained in CARON's experiment in the former way contained but one-third of the amount of phosphorus which was contained in that obtained in the latter way.

In the meantime, it appears improbable that this circumstance can be of any importance for the furnace process itself, for there are, perhaps, few furnaces where fluor spar can be obtained at so low a price as that it can form a principal part of the slag, the rather because a considerable part of the fluor spar placed in the furnace must be destroyed by the formation of volatile fluoride of silicium.

On the other hand, another method, patented by HENDERSON (2), of using fluor spar for purifying from phosphorus may possibly come to be of greater practical value. The method in question has for its object to purify at the same time from phosphorus and silicon, by mixing in finely pulverized fluor spar and iron ore (preferably titanic iron) when the pig-iron is run out.

HENDERSON (3) himself considers that the silicon is in this case removed as fluoride of silicon, and that the separation of phosphorus depends on the formation of some volatile compound of fluorine and phosphorus. The last-mentioned view is also thought in some degree to be strengthened by some analyses made by RILEY, (4) for he found in the pig iron used in an experiment of this nature 1·14 per cent. phosphorus, while the pig iron, treated when it was run out with 28 per cent. ilmenite (titanic iron ore), 2·8 per cent. black oxide of manganese, and 11·7 per cent. fluor spar, contained only 0·12 per cent., but in the slag which did not contain any fluorine, there was found not more than 0·52 per cent. phosphorus. From the statements made, we cannot, in the meantime, ascertain which slag it was that was examined, but it appears probable that it was that which was obtained by puddling the pig produced in this way, and it is therefore not easy to draw solely from this any certain con-

(1) "Comptes Rendus, T. 66, p. 744.
(2) "Oesterreichische Zeitschrift für Berg-und Hüttenwesen," 1871, p. 115.
(3) The "Journal of the Iron and Steel Institute," 1871, Vol. I., p. 498.
(4) *Chemical News*, Vol. XXV., p. 237. "DINGLER'S Journal," Bd. 204, p. 480.

clusion about the way in which phosphorus is driven off. The supposition that phosphorus is removed as a volatile compound with fluorine is opposed, for instance, to the results of several experiments made in Percy's (5) laboratory, which are thought to show that if phosphorus has no opportunity to oxidize itself, fluor spar can exert no influence on phosphide of iron; for an intimate mixture of fluor spar and phosphide of iron was kept fused, both in a graphite and in a clay crucible, a whole hour without the weight of the phosphide of iron being noticeably diminished. It is thought, therefore, not to be altogether improbable that the mutual action of the fluor spar and the iron ore upon the pig iron depends on this: that at the same time as the silicon is volatilized as fluoride of silicon, the phosphorus is oxidized by iron ore, which is incorporated with the pig, to phosphoric acid, which, as phosphate of lime and protoxide of iron, is removed in the surplus of fluor spar.

*The removal of Phosphorus during the refining of pig iron.*—If phosphorus, during the refining of the pig iron, can be removed in the refining slag, it must, for the reason stated above, be in the form of salts of phosphoric acid, and it is clear, therefore, that more phosphorus is removed during refining in the same proportion as the refining slag is richer in protoxide of iron and the temperature lower. The refining processes in which the slag is most acid or poorest in protoxide of iron have, therefore, the least power to purify from phosphorus, and the chief reason why no phosphorus can be removed in the Bessemer process is without all question to be sought for in the circumstance that the slag formed is so poor in protoxide of iron. It may, indeed, be thought that this inconvenience might be diminished by the addition of some basic substance; but such a proceeding has in this case little or no effect in purifying from phosphorus, for the walls of Bessemer furnaces are formed of quartz, and at the high temperature ruling with this process, a more basic slag saturates itself very speedily with silica from the furnace walls, which are thereby eaten away. To the want of power in the Bessemer process to purify from phosphorus conduces finally, in all probability, the high temperature; for the raising of the temperature increases the power of the iron containing carbon again to reduce the phosphorus that may have been oxidized.

The other refining processes which have slags richer in protoxide of iron can, on the other hand, purify from phosphorus to a greater or less extent; but the removal of this substance must take place by oxidizing, which, again, is counteracted by the presence of carbon; so that it is not to be wondered at that hearth-refining, in this respect, stands far below puddling; for when the latter refining method is employed there is not any carbon in contact with the material operated on, as there is in the hearth-refining process. It is, however, by no means a necessary consequence of puddling that much phosphorus is separated by this process, for if the puddling is carried on with "raw" slag, as poor as possible in protoxide of iron, and a high temperature, little phosphorus is removed. In order to purify from this substance to the greatest possible degree it is necessary that the slag have considerable refining power, which is commonly brought about by adding rich ores free from phosphorus. In this way the greater part of the phosphorus contained in the pig iron may be removed by puddling, so that while the phosphorus contained, for example, in Cleveland pig, is generally about 1·5 per cent., the iron puddled from it sometimes does not contain more than about 0·3 per cent. phosphorus. In general it is supposed that three-fourths of the phosphorus contained in pig iron can be removed by careful puddling, but it is also no uncommon thing to find in puddled slags from districts where the iron is rich in phosphorus, 6 per cent., and even up to 8 per cent., phosphoric acid.

For the purpose of purifying from phosphorus, during puddling, yet more completely, there are employed besides, not unfrequently, other additions which are kept more or less secret. Among these ought, perhaps, to be mentioned Scheerer's (6) mixture of equal parts of chloride of calcium and common salt, which is added in cartridges during the puddling in such quantity that these salts together weigh about three times as much as the phosphorus which is found in the iron.

Sherman has attemped to use compounds of iodine in place of chlorides for the same purpose, and several technical journals, during the year 1871, gave many wonderful statements of the advantages obtained by this method; but all those panegyrics have again become silent, and now no further inquiry after Sherman's process is thought of.

Before we leave the question of the removal of phosphorus from iron during refining, it ought finally to be pointed out that where other circumstances are the same, it is probably more difficult to separate phosphorus from iron in the same proportion as the latter is freer from other substances, as silicon and carbon; for the more nearly saturated the iron is with them the less propensity ought it to have both to retain the phosphorus combined with it, and to reduce it when it is oxidized. This view of the matter, which has been stated by Mrázek, affords an explanation both of the fact that the slag formed at the beginning or during the process of refining is richer in phosphorus than at the conclusion, and of the advantage of refining in a separate furnace pig iron containing much phosphorus. The process, in fact, is broken off during refining before the iron has been sufficiently freed from silica and carbon to endeavor, with its full force, to combine with phosphorus.

*The action of Saltpetre in purifying from Phosphorus.*—Saltpetre is a very powerful means to purify fused iron from phosphorus, for by the strong heating the nitric acid is decomposed, and the gases, rich in oxygen, which are thus formed oxidize the phosphorus, at the same time that the remaining alkali affords the phosphoric acid thus formed a strong base to combine with. But the difficulty attending the use of saltpetre for this purpose is, duly to utilize its oxidizing action, for if it is thrown upon a bath of fused iron it remains on the surface, and the gases rich in oxygen, which are driven out from it can thus exert no influence upon the iron. In Heaton's process for refining by means of saltpetre it is, therefore, placed on the bottom of a vessel, and upon it an iron plate closely perforated with small holes, over which the pig iron is run, so that the gases rich in oxygen, which are driven out from the saltpetre, in their escape must force their way through the whole mass of iron. As an example of the purifying action which can thus be attained, it may, in conclusion, be stated, on the authority of Gruner (7), that the content of phosphorus was brought down, in this way, from 1·485 per cent. in the pig iron to 0·64 in the refined or half-refined product, by the use of 9·5 per cent. of the pig iron's weight of Chili saltpetre.

*Iron's content of Phosphorus diminished by fusion in mixture with Charcoal.*—The circumstance, stated at the beginning of this section, that somewhat more than half the amount of phosphorus is removed when charcoal is added in excess during the reduction of phosphate of protoxide of iron, while carbon is taken up instead by the iron, already shows that carbon has a certain, if inconsiderable, power of driving a portion of phosphorus out of its combination with iron. This has been further confirmed by an experiment made in Percy's laboratory, in which pulverized phosphide of iron, with 23·23 per cent. phosphorus, covered over with charcoal powder, after an hour and a-half's heating to a white heat in a graphite crucible, yielded a regulus which contained only 18·1 per cent. phosphorus, but was supposed to have taken up some carbon instead, as when treated with hydrochloric acid it gave off hydrogen with the same smell as when iron containing carbon is dissolved in the same acid.—*Iron.*

(5) "Metallurgy; Iron and Steel," p. 67. Percy-Wedding, Abth. I., p. 86.
(6) "Bayerisches Industrie und Gewerbeblatt," 1872, p. 168. "Dingler's," Bd. 204, p. 482.
(7) "Annales des Mines," 6ème Série, T. 16, pp. 217, and 248.

TO BE CONTINUED.

## Shale-Gas and Gasoline.

The production of a light and very volatile hydro-carbon liquid, capable of being used in the manufacture of what is called air-gas or pneumatic gas, has excited much attention in various quarters during the last year or two, and more especially since any difficulty arose with regard to an abundant and regular supply of gasoline, one of the most volatile distillates obtained from American petroleum. Knowing that a great demand exists for such a substance in this country, various persons have turned their attention to the question, in the hope that they might be able to prepare it in large quantities and at a cheap rate, from the products of the distillation of carbonaceous shales at a low red heat, a process which is practised on the large scale for the production of hydro-carbon illuminating oils, and which likewise involves the simultaneous disengagement of large quantities of gas which has hitherto practically proved to be incondensable. One of the workers in this field for practical and scientific investigation is Mr. J. J. Coleman, F. C. S., of Glasgow. A paper from that gentleman bearing upon the subject was on Thursday evening communicated to the Chemical Society, the substance of which is embodied in the present article.

The quantity of carbonaceous shale distilled in the United Kingdom is very large, amounting, probably, to 800,000 tons per annum. As the amount of uncondensed gas produced per ton of shale is from 2,500 to 3,000 cubic feet, it is evident that, even with the lower estimate, and with 300 working days per annum, the production of this gas is not less than 6,000,000 cubic feet per day. Such gas has an illuminating power of twenty-four to twenty-six standard candles, and at ordinary atmospheric temperature and pressure it has some resemblance to ordinary coal-gas. Like ordinary coal-gas, also, it contains considerable hydro-carbons, which are removable by passing a current of it through cold dense liquid hydro-carbons—what are generally spoken of as "heavy oils." In one instance, at least, this process is taken advantage of in the extraction of some of the more condensable ingredients of that portion of the gas which is not directly employed for illuminating purposes; its efficiency, however, is dependent upon the temperature and mass of the absorbent liquid, which is difficult to control in warm weather. The prime feature in the process hitherto employed is the use of a "scrubber," as in ordinary gas-works; with this difference, however, that the condensing or absorbing agent that is pumped into the tower of coke, and allowed to fall in a spray from the top down through the mass, is a heavy hydro-carbon oil. This oil is drawn off at the bottom of the "scrubber" and distilled, the dissolved volatile hydro-carbon being separated. The heavy-oil scrubber has been in operation at the works of Young's Paraffin Light and Mineral Oil Company, and those of the Oakbank Oil Company, for a number of years, and the result has been that a volatile hydro-carbon liquid has been obtained of the average specific gravity of ·720. This principle of absorbing volatile hydro-carbons by denser hydro-carbons was carefully studied by Faraday, half a century ago. In speaking, in his "Experimental Researches on Chemistry and Physics," of experiments made, in 1825, on the liquid hydro-carbons contained in coal-gas, he says: "Oil may be used in a similar manner to sulphuric acid for the separation of these vapors. It condenses six volumes of the most elastic vapors at common temperatures, and it dissolves with greater facility the vapors of those liquids requiring higher temperatures for their ebullition." "I found," he continues, "that in mixtures made with air or oxygen for detonation, I could readily separate the vapors by means of olive oil. In the same way some of the more fixed essential oils may be used, as oil of turpentine—and even a portion of condensed oil-gas itself, as that which requires a temperature of 220° to 230° for its ebullition."

Some of the shale-works gas is employed like ordinary coal-gas in the illumination of small towns and villages in their vicinity; but hitherto the quantity so used has formed a small proportion of the whole production. The quantity would doubtless have been very much greater had the oil works been within easy reach of large centers of population. At one time it was seriously proposed to supply the city of Edinburgh with such gas from Young's Mineral-Oil Works. At many shale-oil works the uncondensed gas is practically allowed to go to waste, unless by night, when it is used to light up the vicinity of the stacks or benches of retorts; but in other instances it is largely employed in generating heat in the retort fireplaces, or in the furnaces of steam-boilers. It has recently been found, however, by Mr. Coleman, that shale-works gas contains condensable hydro-carbons that had never previously been suspected, to the extent of three gallons per ton of shale, of ·683 specific gravity, in winter time, while the quantity obtainable in summer weather will probably amount to four gallons per ton of shale.

The experiments by which Mr. Coleman determined the fact just mentioned were made with the gas supplied to the small town of West Calder, which contains several thousand inhabitants, and is adjacent to, and supplied from, the Addiewell Works of Young's Mineral Oil Company. It was crude gas that was used, being taken from the main at a point immediately before its junction with the lime purifiers; and it had a temperature of about 50° Fahr. in each experiment. The experimental apparatus used in the inquiry was constructed as follows: A force-pump, with a piston 1¼ inches in diameter, was attached to one end of a 12-foot length of ordinary half-inch gas pipe placed at a slight inclination. At the opposite extremity of the pipe a loaded valve was fixed, which allowed the gas to blow off at any required pressure up to that of ten atmospheres. At a point 9 feet distant from the pump a brass bottle of about 30 cubic inches capacity was screwed by means of a T-joint, and hung vertically, so as to act as a reservoir for any condensed liquid. At a distance of 10 feet 6 inches from the pump the gas was made to descend 2 feet 6 inches through two copper ¼-inch tubes into a second brass bottle, from which it ascended by two other copper tubes to the level of the main, which it joined on the further side of a diaphragm fixed in the main. The object of this arrangement was to afford the means of cooling the gas to zero Fahr. after having been previously deprived of all vapors condensable at atmospheric temperatures. This was effected by surrounding the copper tubes with ice and salt contained in a tin plate vessel encased with dry sawdust.

Before each experiment was performed, the efficiency of the pump for air was

determined by measuring the volume passed through the loaded valve at the pressure intended to be used in the experiment. The results afforded the data for calculating the volume of gas passed in a given time, upon observations being taken of the speed of the pump and pressure, when gas was substituted for air. The pressure was kept very steady, however, in all the experiments, as indicated by observations taken every quarter of an hour, at about 140 lb. to the square inch, registered by a Bourdon gauge; and the speed of the pump was very regular, averaging 130 strokes per minute. Power was obtained from the shafting of an engineering fitting shop.

*First Experiment.*—In this experiment 19 cubic feet of gas were passed through the apparatus in 1¾ hours at a constant pressure of 140 lb. to the square inch. At the conclusion of the experiment, the load on the valve being too suddenly removed, the contents of the first receiver were partially transferred to the second. On this account the two liquids were mixed together and measured. The quantity amounted to 1,300 grain-measures, which is equivalent to 68·42 grain-measures per cubic foot of gas, and the specific gravity of the mixed products was ·685 at 60° Fahr.

*Second Experiment.*—Gas to the extent of 16¼ cubic feet was passed through the apparatus in 1½ hours at the same pressure. The condensation was as follows:

| Temperature of condensation. | Grain-measures. | Specific gravity. |
|---|---|---|
| 40° Fahr. | 830 | ·690 |
| Zero | 350 | ·650 |

These figures give an average of 71·51 grain-measures for each cubic foot of gas.

*Third Experiment.*—This experiment was made ten days subsequent to the other two. The cup leather of the piston having been in constant use, it became necessary to determine with care the efficiency of the pump, which was done with air in a series of observations extending over two hours. Gas was afterwards turned on for five hours, and the quantity passed determined as 45 cubic feet, which yielded:

| Temperature of condensation. | Grain-measures. | Specific gravity. |
|---|---|---|
| 60° Fahr* | 1,750 | ·691 |
| Zero | 1,350 | ·658 |

* By keeping the gas main at the temperature with water.

These figures show an average of 68·88 grain-measures per cubic foot, and as 70 grain-measures per foot of gas are equivalent to one gallon per 1,000 cubic feet, they indicate the presence of the liquids in the gas in about that proportion.

It is interesting to note that the gas remaining after the removal of the condensable hydro-carbon had entirely lost its illuminating power, burning a fish tail or bat's wing burner with a flame not more luminous than that of an ordinary Bunsen burner.

Of the two liquids obtained in the experiments, that having a specific gravity of ·650 to ·680 is most interesting. It contains a small quantity of a liquid boiling with the warmth of the hand. After the evaporation of that portion, the remaining liquid becomes comparatively fixed at ordinary temperatures. Both products had an offensive odor, owing to the presence of sulphur compounds, which was removable, however, with but trifling diminution of bulk, by agitation with caustic soda.

Upon mixing the two liquids together and distilling, it was found that ebullition commenced at 85 deg, Two-thirds of the mixture distilled over at temperatures ranging between that point and 160 deg. Fah., and the remaining one-third passed over under the boiling point of water. As soon as sufficiently large quantities of the liquids are obtained, Mr. COLEMAN proposes to make a complete examination, both of the liquids themselves and of the residual gas. In the meantime, the general result of the investigation, coupled with figures already well known, indicates that the total products obtained by the action of low red heats upon carbonaceous shales are associated as follows :

| | per cent. |
|---|---|
| Non-luminous combustible gas | 20·0 |
| Condensable volatile hydro-carbons associated with the gas in the form of vapor, and obtained at a pressure of ten atmospheres, and a temperature of zero | 4·9 |
| Paraffins ranging in specific gravity from ·700 to ·900 | 53·2 |
| Tarry matters (acid and basic) | 21·9 |
| Total | 100·0 |

The liquids obtained by Mr. COLEMAN differ from the liquids obtained by compression of what was formerly called "oil gas," a product of the distillation of resins and fats at high temperatures. FARADAY states in a paper submitted to the Royal Society in the year 1825, that the liquids from compressed oil gas had a specific gravity of ·821, and he showed them to have consisted of benzol and liquid olefines. Mr. COLEMAN believes that the liquids which he has obtained in his experiments contain the alcoholic radicals, such as were obtained by PELOUZE and CAHOURS, SCHORLEMMER, RONALDS, and GREVILLE WILLIAMS, from light petroleum and certain British cannel naphthas, but probably they contain individual hydro-carbons that have not hitherto been found or isolated in any quantity.

From the action of bromine upon the liquids it would seem as if they contained olefines ; but olefiant gas itself would appear to be entirely absent from shale-oil-works gas, owing to the non-luminous character of the residual gas after compression and cooling. As bromine absorbs 10 per cent. of the illuminating hydro-carbons from shale gas, and compression and cooling separate 20 per cent, it is probable that the alcoholic radicals exist in about equal proportion with the olefines.

The large quantity of liquids condensable by pressure and cold seems to have been overlooked from the fact that the condensable hydro-carbons have hitherto been calculated upon the basis of the absorptive action of bromine upon the gas, whereas that agent has no action upon the alcoholic radicals which constitute (as proved by the specific gravity of the liquids referred to) so large a proportion of the vapors dissolved in the gas. Mr. COLEMAN made an experiment with his apparatus upon Glasgow Corporation gas, and at a distance of two miles from the gas works no liquid was obtained at a pressure of ten atmospheres and a temperature of 320 deg. Fah., even after working the pump for twelve hours.

Mr. COLEMAN'S investigations seem to indicate the possibility of getting a good supply of liquid hydro-carbons, sufficiently volatile to be suited for air-gas purposes, or, what is, perhaps, of equal importance, a supply of liquids suitable for increasing the illuminating power of poor coal-gas. One gallon of the liquid of ·660 gravity volatilized into 5,000 cubic feet of coal-gas would increase its illuminating power by several candles, while in some such proportion as that there would not be involved any condensation in the gas mains by atmospheric changes of temperature. Mr. COLEMAN has devised and patented a method of producing these highly volatile liquids on the large scale. It involves (1) the pumping of the gas by steam-power into a system of condensers ; (2) employing the residual gas while in its compressed state for working a second engine which is to be used for pumping fresh quantities of the original gas, or in helping the first engine to do its work ; (3) employing the expanded gas after having had its temperature reduced to or below zero in the act of doing work, as the agent for keeping up the necessary cold for condensation.

## Wonderful Retention of Heat.

ON the 30th of October last, about 2 o'clock in the afternoon, the large new air shaft of the Belcher mine, then completed to the 1000-foot level, took fire and was destroyed. The timber of the shaft all burned out and the rock fell in and blocked it up. After mature deliberation it was thought that it would be better and cheaper to sink a new shaft than to try to clear out the old one, so badly were the sides caved and so great was the quantity of rock that had fallen into it. The new shaft was sunk a short distance to the west of the old one. It has now reached a point near the 1000-foot level, where it will be continued down an incline. The incline was started at the 1000-foot level, and carried up to meet the vertical portion of the shaft. The course of this incline carried it through the remains of the old vertical shaft, but as soon as it was tapped the men found that they could do nothing in it on account of the ashes, burnt earth and rocks that poured down into their incline. A tunnel was run until it had reached a point a short distance west of the the old shaft, when a vertical upraise was made to the line of the proposed incline to be run up to meet the new shaft. The men then began to work down on the incline in order to reach the point from which they were driven in trying to come up. They have succeeded in getting into the bottom of the old shaft, where, much to their surprise, they found the rock still red hot. In trying to put in timbers they were set on fire, and in order to work at all it is found necessary to bring a line of hose into the place and play a stream of water upon the rocks wedged in the bottom of the old shaft. There is no timber on fire among the rocks. They seem to have been heated to a degree so intense at the time of the fire, that they have remained red hot ever since. When we find so small a mass of rocks as can be contained in the bottom of a shaft remaining hot for over five months, after having been heated to whiteness, should we be incredulous on being assured by scientists that the center of the earth, once a molten mass of rock, still remains in a molten state after untold ages? Nearly three years after the great fire in the Yellow Jacket mine, places were found in the lower levels where the rock was still red hot.—*Virginia Enterprise.*

## Coalfields of Puget Sound.

FROM the letter of a correspondent of the *Bulletin*, we extract the following information about these coalfields :

PUYALLUP VALLEY.

is discovered to be an extensive coalfield, containing immense veins of the finest domestic, steam and gas coal. This coalfield is located about thirty miles from Tacoma. The Directors of the Oregon Steam Navigation Company contemplate building a narrow gauge railroad from Tacoma to their valuable claims there, to connect with the Northern Pacific railroad at Tacoma to Kalama, on the Columbia river. There is no doubt but this is one of the most valuable discoveries yet made on the Sound. This railroad will pass through the beautiful and fertile valley above named, that is now coming into prominence as admirably adapted for raising hops to great advantage. The valley is twenty-five miles long by a breadth of seven miles.

THE SEATTLE COAL AND TRANSPORTATION COMPANY

has passed through the painful experience of many similar companies in their early attempts to succeed.

The mine is now thoroughly organized, with ample capital, and is in good working order. It is located seventeen and one-half miles from Seattle, three miles beyond Lake Washington. The shipping point is the bay of Seattle. The coal is brought from the mine to Lake Washington by railroad ; then across that lake ten miles, in barges that carry eighteen cars ; then a railroad portage of half a mile ; then three miles across Lake Union ; then a mile of railroad that lands the coal at the depot, where it is either put on board a vessel from the cars or placed in the bunker, that holds 1,000 tons. Four round trips are made every day to and from the mine, bringing fifty tons each trip. At present eighty miners are employed and fifty-five outside men, such as drivers, mechanics and laborers. The company pay about $10,000 a month for wages and improvements. The company have 1,000 acres of coal lands in one body. Two tunnels are opened for half a mile each, and both are in working order ; they run in such a gentle incline as to drain themselves. The two veins run for three miles, and have each an average of four and a-half feet of pure coal. There are other veins not yet opened, some of them containing seven, and others ten feet thickness, in all thirty-two feet of solid coal. At the shipping depot there are workshops for making cars. D. W. JONES is the superintendent of the mine. C. B. SHATTECK has charge of the transportation departments. Two large barges are ordered that will carry sixty cars, or 120 tons of coal each ; a powerful locomotive is on the way to take the place of a small one at the mine. A large steamer for towing is to be built immediately to take the place of an inferior one, so that by the first of July there will be 300 tons of coal sent out from the mine daily ; by the month of August there will be 400 tons, and by October probably 500 tons, or 3,000 tons a week. The coal is excellent for domestic purposes and very good for steamships, locomotives and furnaces. Miners are paid $1 25 a ton ; good miners make an average of $4 per day ; carpenters get from $3 to $4 ; drivers get from $2 to $3 ; common laborers get from $30 to $40 a month and board. There is a good demand for all these classes of men.

THE RENTON COAL MINE

is located on Cedar river, a mile from the head of Lake Washington, and the same distance from the mouth of Black river, on the divide between Cedar river and White river. The mine was commenced to be opened about twelve months since. Fifty miners and others are employed. Seventy-five tons of coal are taken out daily, put into a bunker and screened as they descend ; then they are put in cars from the bunker, sent by rail two miles to Black river, put on barges, and towed by steamer down Black river into Duwamish river, thence to Seattle and put into a large bunker on the wharf, that holds 1,200 tons, to be shipped to San Francisco as vessels arrive. The distance from the mine to Seattle is twelve miles. The main tunnel was opened 600 yards, two months ago; since then ten rooms have been opened. The vein of coal now being worked is seven

feet thick of solid coal. The coal ranks among the best for domestic purposes and is well liked for raising steam.

By the first of July, the company will be in a position to ship 100 tons a day. The claim contains 730 acres of coal lands. Some of the veins, so far as known, are better than the one opened. The company is a joint stock one, known as the Renton Coal Company. It is composed of a numerous list of shareholders, who are entitled to a certain quantity of coal yearly, in proportion to the number of shares that each holds, at eight dollars a ton, in addition to the dividend on the profits of the company. The directors and shareholders are all San Francisco people. Mr. ROBBINS is in charge as superintendent,

THE TALBOT COAL MINING COMPANY.

This mine is on the same divide as the Renton mine, between Cedar and White rivers, and three-quarters of a mile from Black river. The mine was opened early in November ; 225 feet of tunnel were cut before coal was struck. The tunnel is now 535 feet long ; twenty miners are employed and sixteen outside men ; 600 tons of coal are in the bunker ready for being forwarded to Seattle for shipment to San Francisco. The coal is taken from the mine to the bunker in cars by rail a third of a mile long, then from the bunker to Black River, a short distance, in cars, put on barges and towed to Seattle by way of Black and Duwamish rivers, twelve miles in all. The company owns 320 acres of coal lands. The tunnel opened has a vein ten feet thick of pure coal of the best kind for domestic uses and steam purposes, as well as for ordinary blacksmith work.

CEDAR MOUNTAIN MINE

is located on the same divide as Renton and Talbot mines, six miles above Renton mine, and, like it, near the margin of Cedar river, running into the mountain that forms the divide. It has only been partially opened as yet, but there is no doubt that it contains an immense quantity of coal of a superior kind. The vein shows a thickness of coal from nine to twelve feet in different places. There are 220 acres of coal lands connected with the mine. The mine has been lately purchased from Messrs. MCALLISTER and GEORGE, of Seattle, by a San Francisco company, for $25,000. Active operations will commence for opening the mine as soon as it is settled that the Seattle and Walla Walla Railroad is to be built that far. There is some prospect of that road being built twenty miles this summer. The road is already graded seven-eights of the twenty miles. When built it will give an immense impulse to the coal trade and other enterprises in and around Seattle.

THE CLYMER MINE

is located near the junction of Cedar and Black rivers, a short distance from the head of Lake Washington. It is an old mine, but was never worked to advantage. The present owners have commenced in earnest to open the mine and work it effectively. There are 340 acres of coal lands owned by the company. It is claimed that there are seven feet of solid coal in the vein. When the Seattle and Walla Walla Railroad is built the first twenty miles, this company will have ample facilities for sending their coal to Seattle for shipment.

OTHER COAL MINES.

There are four other coal mines on Stilagnamish river, and one on Snohomish river, not yet worked. It has been fully tested that this coal is equal to the famous Blossburg and Cumberland coal for blacksmiths. The company are now supplying a large number of blacksmiths on the Sound with this coal, and will soon be in a position to meet the entire wants of the Territory at moderate rates. Competent judges say that the same coal will make the best of gas, and coke beautifully. It is a soft coal, and requires to be shipped in bags or barrels.

## Origin of Coal.

BY ANDREW ROY.

THE rocks of the earth, known as the "Coal Measures," consist of a series of beds of sandstones, shales, limestones, fireclays, iron-ores, and coals in manifold alternations. The beds of coal are now universally held by men of science to have been formed from the decomposition of vegetable matter—the leaves and stems of ancient plants and trees which grew and died, and became decomposed and mineralized on the spot where the coal is now found ; and the associated beds of rocky strata to have been derived from the sediments of the water which flowed over the carbonaceous accumulations during the subsidence of the land. Several other theories have been advanced, accounting for the origin of coal—as that it is of animal origin, or that it was formed from petroleum. BISCHOFF and other eminent geologists held that the carbonaceous matter was an accumulation of vegetable detritus, which had been drifted by rivers into bays and estuaries, as the vast rafts of dead floating trees now accumulate in the Lower Mississippi ; but careful examinations of the remains of the original coal plants found in the floor of the coal, first brought to notice by Sir WILLIAM LOGAN in 1840, during a survey of the South Wales coal field, have confirmed the theory that the vegetation grew on the spot where it is now buried.

During the coal formation period, in the history of the earth, vast marshes or swampy plains skirted the ocean, or perhaps formed low islands near the shore. Upon these marshes there grew a profuse and luxuriant vegetation, consisting of numerous beautiful and various plants, varying in size from small mosses to stately trees, which, year after year, dropped their leaves and fruit, and in time died themselves. New forests arose and died in succession, growth and decay going on through many slowly-moving centuries, until a mingled mass of vegetable tissue was accumulated like the pulpy mass of a peat bog of the present day. At length, through the agency of subterranean movements, the area of the coal marsh became depressed with much uniformity, the land slowly and gradually sunk, and the waters of the ocean flowed in over the carbonaceous accumulation, bringing along mud and sand and other sedimentary materials, which settled to the bottom. As the sinking process continued, the ocean currents brought in more detritus, covering the older depositions, which, becoming compressed by the accumulating weight, solidified, forming into sandstones, shales, etc., according to the nature of the materials. The buried peat bog also became greatly compressed by the accumulated weight of this detritus, the original plants and peaty tissue matting together and becoming hard and compact, while a portion of the gases escaped in the form of carburetted hydrogen and carbonic acid by slow distillation and putrefactive fermentation.

The subsidence period was in time arrested, and was followed by a long period of rest, when the waters of the ocean becoming filled up, there was formed a new subaereal surface. A growth of vegetation covered this new plain, as in the former case. Generations of forests again succeeded each other, and again the vast marsh accumulated matter capable of forming a second seam of coal. Then followed another downward movement of the land, and another burial of the coal vegetation by the detritus of the water. The set of processes thus described was repeated in the formation of every seam of coal and its associated beds of strata ; the periods of elevation were longer or shorter according to the amount of vegetable matter which accumulated on the marsh ; and the periods of subsidence were longer or shorter according to the amount of strata which accumulated between the different beds of coal.

Many geological writers maintain that during the Carboniferous era, the atmosphere of the earth was intensely hot, and was also saturated with vapor, and charged with undue proportions of carbonic acid gas which had been liberated from the interior of the earth through the agency of volcanic eruptions, these conditions being claimed as essential to the production of the coal vegetation. But as coal is found in nearer formations than the Carboniferous era—the coal of China belonging to the Triassic and that of the Pacific Coast to the Cretaceous formations—and as coal is doubtless forming now in many places of the earth, it may be fairly assumed that the climate of the Carboniferous age was not unlike the climate of the present age, although, perhaps, more mild and equable ; only the plants and animals were different. Instead of one peculiar coal-bearing age, all ages, perhaps, as well deserve to be called carboniferous. Sir CHARLES LYELL, in his "Principles of Geology," writing of the formations of the Delta of the Mississippi, mentions instances of whole forests of strata sunk as they grew, and covered to a depth of several hundred feet with an accumulation of mud and sand and vegetable soil in alternating beds, in the same manner as the coal marshes were covered up in the primeval ages. The sunk country of New Madrid, a water space of nearly 80 miles long and 30 miles wide, caused by the earthquake of 1811-12, was filled, as late as the year 1846, with dead trees, some standing erect in the water, as they grew, others fallen down, and lying in dense masses over the bottom, and along the shore. He mentions another case of a track of land, at the mouth of the river Indus, larger than the Lake of Geneva, which was converted into an inland sea in the year 1819 by an earthquake shock, while an adjoining track, 50 miles in length, and nearly 16 miles wide, was raised by the same shock ten feet above the level of the alluvial plain.

The coal strata are full of the remains of animal and vegetable life. Nearly a thousand different coal plants have been described by the geologists. Beneath every seam of coal there is generally a stratum of fireclay—the original land surface, upon which the coal plants grew, in which rootlets, stumps of trees, stems and bark filaments are found. Sometimes the remains of trees, embedded as they grew in the underclay, and standing up through the coal and the roof above, and then abruptly stopping—the upper part having rotted and fallen off—are met with. In the year 1844, at the Parkfield colliery, near Wolverhampton, in England, the workmen mined into a quarter of an acre of coal, which was filled with stumps of trees, standing as they grew ; the trunks, flattened by the pressure of the superincumbent strata, were converted into coal, but were identified. They were found scattered in all directions, having evidently been snapped off by a storm or an inflow of the water, during the sinking of the land, or by an earthquake shock. The roof above the coal is often charged with the remains of ferns, flattened trunks of trees, pieces of bark, branches and leaves, crossing each other in promiscuous profusion.

Of the numerous forms of vegetable matter, from which coal is derived, a great bulk of the coal appears to have been formed from trees allied to the club mosses, ferns and rushes of the present day—more particularly the lower coals. The casts of the sigillariæ, known by their fluted and symetrically scarred bark, often lie full length, as they fell in the mud, immediately above the coal, and can be traced for 50 and 60 feet along the working places of the miners. The gigantic lepidodendron, allied to our modern club mosses, which in the coal era attained a height of 40 feet, lie stretched full length alongside of the sigillariæ. Calamites (the representatives of our rushes) with jointed and striated stems, meet the eye in nearly every mine, and often measure thirty feet in length. The fossil remains of fishes, marine shells and amphibian reptiles are also found interspersed in the roof shales ; one hundred and fifty species of fishes, many of them of immense size as compared with the fishes of the present day, have been discovered in the coal and its associated strata, and the teeth, scales and spines of fishes are frequently found imbedded in the same manner. The tracks of the reptiles, formed as they walked along the soft and muddy sediment of the ancient shore, ripple marks, and the impression of rain drops, have also been seen in the roof shales of some mines.

Some of the coal fields of the world contain strata of immense thickness. At Lundly, in Wales, the coal measures are known to be fully ten thousand feet thick, and to contain 42 different seams of coal, the total thickness of which measures 150 feet. The coal strata of Nova Scotia, at the Joggins, are fifteen thousand feet thick, and include seventy-six different seams of coal, one of which measures thirty-seven feet in thickness, and another twenty-two feet. The coal field of Saarbrücken, on the left bank of the Rhine, in Prussia, has the enormous depth of twenty thousand feet.

It has been estimated by eminent geologists that it would require a period of 150,000 years to accumulate matter to form sixty feet of thickness of coal, an amount far exceeded in many coal fields of the world. In this calculation no account is taken of the different periods of subsidence of the land, where the associated strata were deposited. As the sinking process was slow and gradual, and as fifty feet of strata intervene, on an average, between the different seams of coal, it may be reasonably assumed that an equal period of time was required in building up these strata as occurred in the formation of the carbonaceous matter which formed the coal.

BEROLDINGEN first suggested the theory that the coal beds of the present age were the peat bogs of the primeval ages, converted from peat into brown coal, and then into true coal, and this view is now accepted by every intelligent geologist. The progressive steps from peat to anthracite are described by Dr. NEWBERRY, the eminent State Geologist of Ohio, in the report of progress of the Ohio Geological Survey for the year 1870 : "As we find it in the earth, coal forms one of the different minerals which represent but different stages in a progressive change from vegetable tissue as found in the living plant. In peat and lignite we witness the first step in the formation of coal. Peat is bituminized vegetation, generally mosses and other herbaceous plants, which, under favorable circumstances, accumulate in marshes, and hence are called peat bogs. Lignite is the product of a similar change effected in woody tissue, and because it retains in a greater or lesser extent the form and structure of wood, it received the name it bears. Peat is the product of the present age, and lignites are found in deposits of recent geological age. In the older formations these accumulations, still further changed, are bituminous coal. Where special and local causes have operated to carry the change still further, as where the beds of coal have been involved in the upheaval of mountains, and heat has acted on it, it is converted into anthracite."

(TO BE CONTINUED.)

## Gas Making from Wood and Petroleum at Ingersoll, Ont.

DATE AND EICHBAUM'S PROCESS.

WE get the following particulars from an Ingersoll paper:—We had the pleasure on June 5th, together with several of our business men and the Directors of the Ingersoll Gas Company, of visiting the Company's works, for the purpose of witnessing the manufacture of gas by the above process, which has been in successful operation for some time in the Company's works here—lighting the town to the entire satisfaction of consumers, who pronounce it equal, if not superior, to the best coal gas.

On arriving at the works, we were shown a bench of retorts (threes) arranged for the process, which requires but slight alterations from those used in the manufacture of coal gas. The upper retort is provided with an inner or interior retort, made of cast iron, in which crude petroleum is introduced by an ingenious apparatus, by which compressed air is used for injecting crude petroleum.

The operator has perfect control of the amount of oil introduced, which enables him to make gas of any desired quality or candle power required. After being shown the retorts and apparatus by Mr. DATE, one of the inventors of the process, they proceeded to charge the retort, to demonstrate the rapidity and quantity of gas that could be produced. One of the lower retorts was charged with one hundred and fifty pounds of ordinary cord-wood, and after the gas commenced evolving, which was almost instantaneous, by arranging the valves, the wood gas was thrown into the interior or upper retort, in which it comes in contact with the heavy vapors produced from the crude petroleum. The two gases being thus united, passing over a lengthened heated surface, become thoroughly decomposed, forming a purely non-condensible or fixed gas, of any required illuminating power, leaving little or no residuum. The charcoal will more than pay for the wood used. The result of the test was as follows: In one hour from the time the first retort was charged, there were 850 cubic feet of gas made, and five and a-half gallons of petroleum used, the holder being raised twelve inches. The second retort was then charged with the same amount of wood (150 lb.). In three hours from the first charge, 1540 cubic feet of gas were made from the 300 lb. of wood and ten and a-half gallons of petroleum—the result of the test being so satisfactory that the directors have already reduced the price of gas to consumers one dollar per 1000 cubic feet.

## The Recent Failures in England.

THE London *Mining World*, of June 26, says: "Taking the failures of Messrs. J. C. im THURM & Co. as the commencement of the period of commercial troubles, the following table may be accepted as a record of the suspensions, and a rough but sufficiently trustworthy estimate of the sums involved:—

| | |
|---|---|
| J. C. im THURM & Company, import merchants, London | £3,000,000 |
| SIORDET & Co., general merchants, Mark Lane (Of which £300,000 likely to run off). | 400,000 |
| GENERAL SOUTH AMERICAN COMPANY | 400,000 |
| A. W. RAMSDEN & Co., worsted manufacturers, Bradford | 40,000 |
| HAY, INGRAM & Co., London and Rangoon | 150,000 |
| W. T. HENLEY, telegraph engineer, London | 300,000 |
| WILSON M'LAY & Co., merchants, Glasgow | 200,000 |
| H. M. GILTON, merchant and commission agent, Manchester | 13,000 |
| J. MORRISON & Co., ship owners and sailcloth manufacturers, London | 200,000 |
| J. & H. BROWNINE, oil trade, London | 150,000 |
| BENNETT & GLAVE, woolen merchants, Leeds | 70,000 |
| A. DE BUSSCHE, steamship owner, London | 100,000 |
| J. ANTONIADI, merchant, Manchester | 15,000 |
| JONAS FOSTER & Co., spinners, etc., Bingley | 30,000 |
| C. E. ALFORTH, timber merchant, London | 100,000 |
| T. RICHARDSON & SONS, engineers and ironfounders, London, and Middleton, near Hartlepool | 280,000 |
| J. H, & A. A. BELL, export merchants, Dundee | 100,000 |
| H. EMMENS BROTHERS, merchants and bankers, London | 140,000 |
| JAMES TAYLOR, shipowner, etc., London and Middlesborough | 253,000 |
| WILKINSON, WATT & Co., steamship owners, London | 100,000 |
| SANDERSON & Co., bill brokers, London | 5,000,000 |
| J. DAWBURN, coal and iron merchant, London | 34,000 |
| E. CORBY, metal trade, London | 200,000 |
| G. A. SMITH & Co., London | 600,000 |
| Plymouth Iron Co., Aberdare (FOTHERGILL, HANKEY & Co.) | 1,300,000 |
| F. A. & M. ZIMMERMANN, drug and chemical merchants, London | 100,000 |
| ALEXANDER COLLIE & Co., commission merchants, London and Manchester | 3,000,000 |
| SHAND & Co., East India merchants, London | 250,000 |
| WILSON & ARMSTRONG, woolen merchants, London | 100,000 |
| RAINBOW, HOLBERTON & Co., London | 150,000 |
| BENSON & Co., bill brokers, London | 1,000,000 |
| HUDSON, MALCOLM & Co., financial agents, London | 100,000 |
| A. GONZALEZ & Co., South American trade, London | 100,000 |
| YOUNG, BORTHWICK & Co., bill brokers, London | 2,500,000 |
| J. C. FOWLIE, merchant, London | 100,000 |
| JOHN ANDERSON & Co., merchants, London | 200,000 |
| H. ADAMSON & SONS, ship and insurance brokers, London | 200,000 |
| J. P. WESTHEAD & Co., Manchester | 200,000 |
| J. STRACHAN & Co | 200,000 |
| | £21,375,000 |

☞ Since the above was published several large failures have been reported by cable.

## The Benefits of Arbitration to English Ironworkers.

MR. JOHN KANE, the Secretary of the Ironworkers' Association, has issued a circular to the members of that body, in which he has the following:—We have frequently been told that neither the Board of Arbitration, nor of Conciliation, nor the Union, has done any good. In answer to such unfounded charges we call on the readers of the journal to read and carefully attend to the following facts, which prove their own value, and which ought to silence the tongue of the mischief-maker and slanderer:—

SIX YEARS' EXPERIENCE OF THE WORKING OF THE PRINCIPLES OF CONCILIATION AND ARBITRATION IN THE NORTH OF ENGLAND ON THE WAGES QUESTION.

GAINS TO WORKMEN SINCE THE ESTABLISHMENT OF THE BOARD OE ARBITRATION, ON MARCH 8TH, 1869.

| | | | | | | £ | s | d. |
|---|---|---|---|---|---|---|---|---|
| In 1869 started with 8s. per ton. | | | | | | | | |
| May, 1869 | 5 per cent. | advance, | making | 8s. 6d. | per ton | 4 | 4 | 0 |
| Jan., 1870 | 10 " | " | " | 9s. 6d. | " | 21 | 16 | 10 |
| Jan., 1871 | 5 " | reduction | " | 9s. 0d. | " gain | 7 | 5 | 7 |
| July, 1871 | 5 " | advance | " | 9s. 6d. | " | 5 | 9 | 3 |
| Oct., 1871 | 5 " | " | " | 10s. 0d. | " | 14 | 11 | 2 |
| April, 1872 | 5 " | " | " | 10s. 6d. | " | 9 | 2 | 0 |
| July, 1872 | 20 " | " | " | 12s. 6d. | " | 39 | 2 | 10 |
| April, 1873 | 7½ " | " | " | 13s. 3d. | " | 57 | 6 | 7 |
| Jan., 1874 | 7½ " | reduction | " | 12s. 6d. | " gain | 16 | 7 | 7 |
| April, 1874 | 10 " | " | " | 11s. 6d. | " gain | 12 | 14 | 10 |
| July, 1874 | 2½ " | advance | " | 11s. 9d. | " gain | 13 | 13 | 0 |
| Oct, 1874 | 10 " | reduction | " | 10s. 9d. | " gain | 10 | 0 | 2 |
| Jan., 1875 | 10 " | " | " | 9s 9d. | " | 6 | 7 | 5 |
| April, 1375 | 2½ " | " | " | 9s. 6d. | " for 3 mos. | 5 | 9 | 2 |
| | | | | | Total.. £223 | 10 | 5 | |
| | | | | | Average for 6 years. . £37 | 5 | 0 | |

A correeponding advance was given to the whole of the tonnage and day men employed in mills and forges as *bona fide* ironworkers who were subscribers to the Board and members of our union, and to non-members. The facts revealed in this table are so important, and the lessons to be learned so instructive, that it is questionable as to whether any other trade in this country can show results as favorable to the interests of the workmen, which is the strongest proof of the good that has been done by our union.—*Iron and Coal Trades Review.*

## Notes.

**Quick Work.**—The change of gauge on the Intercolonial Railway from Point Duchene, N. B., to Halifax was completed in nine hours. There were over one thousand men employed at the work. The cost will be a million of dollars.

**Gas Well in Kansas.**—In digging for coal at Wyandotte, Kansas, the workmen have struck a vein of gas which, in its escape, produces a roaring noise which may be heard a long distance. It is estimated that at least 250,000 cubic feet of inflammable gas escape from the aperture daily.

**Age of the Australian Gold Drift.**—Among some fossils recently described by Professor M'COY, Melbourne, is an extinct wombat from the gold drifts of Victoria. This fossil, called *Phascolomys pliocenus*, is of much interest, as having enabled Professor M'COY to show that the auriferous deposits whence it is derived, instead of being merely alluvial, should be referred to the more ancient Pliocene period, thus corresponding in age with the gold drifts of the Ural.

**Bending Heavy Iron.**—It is now possible by the aid of hydraulic machinery to bend iron shafts of 12 inches in diameter to any required shape. Incredible as this statement may seem to some, crank shafts are now so made, instead of by the slow, laborious and expensive method of forging. The bent shafts are also said to be much better than forged ones, from the fact that the fibre of the metal runs in one direction continuously, whereas in forged ones it is often across the line of strain.

**Russian Coal Fields.**—The coal fields of the Donetz, an affluent of the Don, are about to be traversed by a line of railway which will open up communications with the interior and the sea. The yield of that basin in 1873 was 41,000,000 pouds (36 pounds each); as compared with 19 000,000 in 1872, 12,000,000 in 1871, 11,000,000 in 1870, and only 7,900.000 in 1869. That district alone is able to supply fuel for the consumption of all the countries bordering on the Black Sea and likewise the Bosphorus.

**Evaporation of Metals by Electricity.**—Mr. HOPKINS describes an interesting experiment, which consists in passing a charge of electricity through a very fine thread of platinum, or other metallic foil, the thread being kept in place between slides of microscope glass. The effect of the heat from the electric discharge is to vaporise the metal, which is instantly condensed in a transparent layer upon the cold glass, which can then be studied by the microscope, and can be used in various ways to determine the character of the metal and the peculiarities of the discharge.

**The New Glass Another Process of Producing It.**—It is announced that Mr. CHARLES PIEPER, a German inventor, has devised a way of toughening glass, which the German papers pronounce superior to that of M. DE LA BASTIE, already described in these columns. The Pieper glass is said to be fully as strong as that of the latter inventor, and its appearance is much purer and clearer. Extended experiments upon it have begun in Germany. The Association of German Glass Makers has already entered into negotiations with Mr. Pieper for the use of his invention, suspending similar dealings with M. DE LA BASTIE, on account of the immense price asked by him, over eight million dollars.

**Glycerine as an Illuminating Material.**—M. SCHERING states that glycerine may be burned in any lamp so long as the flame is kept on a level with the liquid. The latter, on account of its consistence, will not ascend an elevated wick. As the flame, like that of alcohol, is almost colorless, and as the material is especially adapted for absorbing a large proportion of saline substances, M. SCHERING has recently made experiments in coloring the flame with various bodies, and with satisfactory results By introducing substances rich in carbon, it appears that the flame may be rendered suitable for illuminating purposes. The low price of glycerine, and its property of volatilizing at high temperatures add to its advantages in this direction.

**Value of Mining Property in California.**—The following shows the assessed value of mining property in California from recent official valuation:

| | | | |
|---|---|---|---|
| Gold and Silver Mines | $160,000,000 | Powder works | $510,000 |
| Quicksilver Mines | 7,000,000 | Stone quarries | 400,000 |
| Mining Ditches | 6,500,000 | Copper mines | 300,000 |
| Coal Mines | 4,000,000 | Borax | 210,000 |
| Iron Furnaces, works, and rolling mills | 3,850,000 | Petroleum | 200,000 |
| Reduction and smelting works | 800,000 | Tin | 100,000 |
| | | Sulphur | 50,000 |
| | | Asphaltum | 10,000 |
| | | Total | $180,930,000 |

**New use for Tin.**—The following is M. HEEREN'S process for giving iron wire the appearance of silver. This is done by a thin film of tin. The iron wire is first placed in hydrochloric acid, in which is suspended a piece of zinc. It is afterwards placed in contact with a strip of zinc in a bath of two parts tartaric acid dissolved in 100 parts of water, to which are added three parts of tin salt and three parts of soda. The wire should remain about two hours in this bath and then removed, and made bright by polishing, or drawing through a polished iron. By this galvanic method of tinning, wire which has been wound in a spiral, or iron of other shape, can be made quite white, which is an advantage over most other methods, where the wire is tinned in the fire and then drawn through a drawing plate.

## Notes.

**Artificial Hardening of Sandstone.**—MANFRED LEWIN has tried with success in his quarries at Saxonia, and at Neundorf, near Pirna, a process of impregnating sandstone. The stone there quarried is porous and readily absorbs water to a certain depth; it is this fact which renders it possible to introduce a solution to harden the surface. LEWIN impregnates the stone with solutions of an alkaline silicate and of alumina; there is thus formed an aluminum silicate within its pores, which gives to the surface considerable resistance. The solutions employed are made with soluble glass and with aluminum sulphate. After the impregnation, the sandstone may be polished like marble, which it then resembles closely. Heated to a high temperature, the exterior layer vitrifies and thus may be colored at pleasure. The coloration may even be obtained simply by mixing the desired pigment with one of the two solutions used for the impregnation.

**Portuguese Art Work.**—A curious and valuable hunting-knife, from the atelier of Senor ESTEVAS DE SOUZAS, jeweler to the King of Portugal, was lost in the recent wreck of the *Cadiz* off Ushant. The sheath and handle were composed of the heads of wild animals and hounds, modelled and chased in silver, and accurately representing the stag, the bear, the wolf, the wild boar, and other *ferœ naturæ* still found in the Lusitanian forests. It was the work of Senor Raphael Zacharias da Costa, who was occupied in its execution for a period of eleven years, from June, 1863, to May, 1874. The knife was 68 centimetres in length, and was sent from Lisbon by the *Cadiz* to be placed on view at the Portuguese Legation, Gloucester Place, London. Unfortunately the model was lost, as well as the knife itself, but from the photographs we have seen it is evident that there is no falling off from the well-earned renown of the Portuguese as artistic workers in the precious metals The hunting-knife and sheath were insured for $7,000.

**The Gas Wells of Pennsylvania.**—The *National Oil Journal* says:—'There is little doubt that the gas escaping constantly from oil wells is of nearly or quite as much value as the oil itself; and it is a matter of wonder that means have not long since been adopted to utilize this immense product of the earth. No estimate can be made of the quantity of this gas, which has for years been allowed to pass away into the air uselessly; but the yield of a few gas wells which have been tubed and their product utilized, indicates that it is enormous. A gas well near Sarversville, in the Butler oil region, flows with a pressure of 300 pounds to the square inch, and is roughly estimated to yield a million cubic feet of gas every 24 hours; and this is only one of quite a number of large gas wells, and almost numberless small ones, for it must be remembered that every well which produces oil also yields gas. A survey has just been completed for a line of pipe from Sarversville to Pittsburgh, a distance of about 17 miles. It is proposed to lay a six-inch pipe between the points named, and to supply the gas to manufacturing establishments as a substitute for coal for fuel in Pittsburgh.'

**Improvements in the Method of, and Apparatus for, Obtaining Ammonia from Waste Products and Other Matters.**—HENRY MICHAEL, patent agent, Fleet Street, London. (A communication from JOSEPH ALFRED FERDINAND LAIB, Boulevard St. Martin, Paris.) August 13, 1874.—No. 2802. The invention is especially applicable for treating waste products, the refuse heat and deposits being utilized, and offensive smells removed; pumps, heaters and separating vessels are combined, with the distilling column into which the liquid whence the ammonia to be extracted is driven, after passing through tubular heaters heated by the freed liquid from the distilling column. Steam and lime-white are introduced into the distilling column, the liquid of which passes into a separator fitted with an internal tube, at the bottom of which the deposits are left; the ammoniacal vapor passes into the sulphuric acid vessels through tubes heated by steam-pipes. To remove offensive vapors, the gases are carried under the generator-furnace. The pumps are regulated so as to feed the liquid and lime-white in proper portions.

**Nanaimo Coal.**—Mr. SELWYN, F. R. S., Director of the Geological Survey of Canada, writes to the *American Journal of Science and Arts* on the age of the lignite coal formation of Vancouver Island. He says: "I wish to record my dissent from the statement made by Professor LESQUEREUX, page 365 of Dr. HAYDEN'S Report on the United States Geological and Geographical Survey of Colorado, 1873, to the effect that the coal of Nanaimo, Vancouver Island, is referable to the Lower American Eocene. Careful surveys have now been made by the Canadian Geological Survey of the Nanaimo coal basin, and it is proved beyond the possibility of a doubt that the coal beds there are overlaid by a succession of strata, shales, sandstones and conglomerates, having a thickness of over 4,000 feet, and holding from base to summit marine cretaceous fossils, ammonites, baculites, inocerami and others. Maps and sections, showing the relative position of these beds and of the coal seams, are given in the Report of the Geological Survey of Canada, 1872–1873; and I would beg to refer Prof. LESQUEREUX to them for information concerning the coal rocks of Vancouver Island. As he makes no reference to the Report named I conclude he has not seen it."

**Rotary Puddling Furnaces.**—This invention consists in—(1) admitting water intermittently to the space between the casing of the furnace (when the furnace is composed of two casings), one mode being by means of valves or cocks, another by scoops or bent pipes, another by a coil of pipes or annular space or duct formed round the outside of the revolving furnace, and another by buckets arranged at intervals around and attached to the outside of the outer casing; (2) effecting the egress of the water from the water space of the rotary furnace by means of pipes or channels, or ducts, one or more of which are coiled round the outside of the outer casing and communicate at one end with the water space; (3) forming the rings which are secured round the ends of the furnace (and which are divided into segments) with recesses on their outer faces respectively, which recesses fit over corresponding projections on the outer faces of the rings against which the furnace rings revolve, and serve to maintain a tight joint and to prevent the waste of cinder and iron thereat, also in connecting the water pipes (which are cast in the bodies of the rings) at their external ends outside the furnace with the water space between the casings by means of branch pipes or connecting pipes; (4) constructing the cast iron or steel end of a single cased rotary furnace in segments which are respectively attached to the circular flanged end of the furnace by bolts, and to each other by internal or external flanges and bolts.—*English Patent No. 4,122, E. A. and J. A. Jones, Middlesborough, Yorkshire.*

**Extraordinary Specimen of American Iron.**—There is now being shown in the Birmingham district an extraordinary specimen of iron-making in the United States. It is a portion of a sheet of very thin iron, so thin that though its surface dimensions are 4 inches by 3½ inches, yet its weight is only 3½ grains, apothecaries' weight. The breath of the nostrils will drive it away almost as if it were the cinder of burned paper. The thinness is itself very surprising, but the extraordinary part of the matter is that the iron has been made from what the Americans term a "muck bar," obtained from a Danks puddling furnace at Pittsburgh without being reworked. Thus, an extreme thinness of iron, which it is almost impossible to secure from the very best materials, worked and re-worked many times over in the usual way, has been got from iron in the state of crudeness in which it was found upon leaving a mechanical puddling furnace. It is assumed in this country that the iron has been made from the ordinary district pigs, and the specimen is deemed to demonstrate the great value of machine puddling as practised by the producers of the iron, and the specimen has an important commercial as well a scientific significance. There is to the iron-makers here the disagreeable inference that if crude iron can be worked to such foil as is described, sheets of greater thickness, but still of a thinness that brings them to the narrowest gauge embraced in the sheets generally made in this country, and which realize very high prices, should be produced by the United States ironmasters at figures so much below those at which alone latens and button iron, for instance, can be made in this country, that the American must be in a position to successfully compete with the British ironmaster for those kinds even in his home market. Men in the trade who have seen the specimen are expressing the belief that the American should be able to compete with the English maker in the Antipodean-colonial, Russian, and Chinese markets, whither large consignments of British sheet-iron are constantly going.—*London Mining Journal.*

**Massive Mining Machinery on the Comstock.**—Every foundry in the city is hard at work, and principally upon mining machinery, showing that the mining interests of the coast are in the hands of enterprising men, who are determined to have the best appliances that mechanic art can give them for the prosecution of their work. The hoisting works for the California and Consolidated Virginia mines, now in course of manufacture at the Pacific Iron Works, is probably the most massive mining machinery ever made. It is to be used on the "C & C." shaft, the joint shaft of the two great mines.

These hoisting works are being made on the same principle as those at the Mt Diablo coal mines. The hoisting is done from the engine shaft, there being no spur-wheels. This will be the first one of the kind on the Comstock, and is of a capacity to hoist 4,000 feet. There are two engines, 26-inch bore and 6 feet stroke, fitted with balance poppet valves and cross cut-off. The cylinders are very ponderous, weighing 16,000 pounds each. The bed-plates will weigh between 16,000 and 17,000 pounds each. There will be one engine on each end of the shaft, the distance between them being 24 feet from center to center. The shaft is 16 inches in diameter in the main journals, and 18 inches where the reels are to be placed. Double reels for flat wire rope are to be used. The reels commence at 6 feet and wind up to 14 feet in diameter. The engines are supplied with two steam brakes, one for each reel, and also a hand brake for each reel. The steam brake is so arranged that the brakeman or engineer can put it on at will, and if the cage should rise higher than it ought to, a connection is automatically made, so that the steam is shut off from the main engines and the steam brake applies itself, thus making accident impossible. There are 6 tubular boilers, 54 inches in diameter and 16 feet long. Only 4 will be used at a time, the other two being reserved for emergencies. Globe valves are used to connect any pair at will. The clutches to throw the engines into gear weigh 4,500 pounds each, and have wrought iron bands shrunk around them for additional strength. There are no gear wheels at all, and the two fly wheels act as brake wheels Everything will be fitted up in the shop before being shipped. The excavations for the reception of this massive machinery at the mine are nearly completed, and the anchor-bolts and plates are being placed in position ready to commence the mason work. It is stated that a duplicate of this machinery has been contracted for by the Lady Washington Mining Company, on the Comstock.—*San Francisco Stock Exchange, May 28.*

## STATISTICS OF COAL PRODUCTION.

*This is the only Report published that gives full and accurate returns of the production of our Anthracite mines.*

Comparative Statement for the week ending July 3:

| | 1875. | | 1874. | |
|---|---|---|---|---|
| | Week. | Year.* | Week. | Year. |
| *Wyoming Region.* | | | | |
| D. and H. Canal Co. | 69,817 | 1,602,359 | 38,641 | 1,276,312 |
| D. L. and W. RR. Co. | 88,235 | 1,684,815 | 39,073 | 1,312,357 |
| Penn. Coal Co | 28,595 | 644,478 | 31,886 | 618,252 |
| L. V. RR. Co | 24,183 | 406,826 | 15,468 | 511,035 |
| P. and N. Y. RR. Co. | 3,894 | 56,714 | 763 | 33,626 |
| C. RR. of N. J | 48,558 | 290,355 | 34,219 | 711,687 |
| Penn. Canal | .. | .. | .. | .. |
| Lack. and B. RR. | .. | 63,596 | .. | 97,019 |
| | 263,192 | 4,749,143 | 160,050 | 4,554,288 |
| *Lehigh Region.* | | | | |
| L. V. RR. Co | 15,665 | 217,074 | 56,976 | 1,580,677 |
| C. RR. of N. J. | 11,140 | 18,780 | 28,074 | 516,442 |
| D. H. and W. B. RR. | 2,140 | 32,576 | .. | 13,009 |
| | 28,945 | 268,430 | 85,650 | 2,110,128 |
| *Schuylkill Region.* | | | | |
| P. and R. R. RR. Co | 151,433 | 864,877 | 70,524 | 2,417,269 |
| Shamokin and Lykens Val. | 33,345 | 548,760 | 22,426 | 398,388 |
| | 184,778 | 1,413,637 | 93,050 | 2,815,657 |
| *Sullivan Region.* | | | | |
| Sul. and Erie RR. Co. | .. | 5,557 | 1,433 | 15,924 |
| Total | 476,915 | 6,436,767 | 340,183 | 9,495,997 |
| Increase | 136,732 | .. | .. | .. |
| Decrease | .. | 3,059,230 | .. | .. |

* Year beginning January 1st.

The above table does not include the amount of coal consumed and sold at the mines, which is about seven per cent. of the whole production.

*The following Table does not give the entire production of our Bituminous mines, but it is by far the fullest report published.*

**The Production of Bituminous Coal** for the week ending July 3, was as follows:

Tons of 2,000 lb., except where otherwise designated.

| | Week. Tons. | Year. Tons. |
|---|---|---|
| *Cumberland Region, Md.* | | |
| Tons of 2,240 lb | 57,023 | 1,069,652 |
| *Barclay Region, Pa.* | | |
| Barclay RR., tons of 2240 lb | 7,889 | 30,087 |
| *Broad Top Region, Pa.* | | |
| Huntingdon and Broad Top RR | 3,303 | 111,078 |
| *East Broad Top | 1,049 | 23,247 |
| *Clearfield Region, Pa.* | | |
| *Snow Shoe | 519 | 36,184 |
| *Tyrone and Clearfield | 24,407 | 402,682 |
| *Allegheny Region, Pa.* | | |
| *Pennsylvania RR | 3,721 | 123,767 |
| *Pittsburgh Region, Pa.* | | |
| *West Penn. RR | 4,618 | 105,053 |
| *Southwest Penn. RR | 126 | 4,388 |
| *Penn. & Westmoreland gas coal, Pa. RR. | 20,473 | 247,641 |
| *Pennsylvania RR | 9,763 | 187,581 |
| *Kanawha Region, W. Va.* | | |
| Chesapeake and Ohio RR | 5,071 | 80,325 |

* To June 28.

**The Production of Coke** for the week ending June 28.

| Tons of 2000 lb. | Week. Tons. | Year. Tons. |
|---|---|---|
| Tyrone and Clearfield | .. | 273 |
| Alleghany Region | .. | 53 |
| West Penn. RR | 658 | 25,097 |
| Southwest Penn. RR | 12,371 | 255,540 |
| Penn. & Westmoreland Region, Penn. RR. | 770 | 13,658 |
| Pittsburgh, Penn. RR | 2,328 | 49,536 |

*The receipts at Buffalo,* via L. S. and M. S. RR. for the week were 3,498 tons. The exports by Lake were 12,244 tons, and imports 420 tons.

*The receipts at Port Richmond* for the week were 60,000 tons, shipments 55,000 tons, and balance on hand 30,000 tons.

*The decrease of shipments of Cumberland Coal* over the Cumberland Branch, and Cumberland and Pennsylvania Railroads amounts to 33,566 tons.

| *Belvidere Delaware RR. report:* | Week. | Year 1875. | Year 1874. |
|---|---|---|---|
| The receipts of coal at Coal Port (Tr'ton) | .. | 206 | 134,901 |
| " " " South Amboy | 913 | 21,358 | 350,558 |
| Shipments of Coal Port (Trenton) | .. | 196 | 133,654 |
| " South Amboy | 414 | 98 711 | 317,712 |

*Shipments from Pictou, N. S*, for the week ending July 3:

| | Tons. Week. | Year. |
|---|---|---|
| To United States | 1615 | 6370 |
| " West Indies | — | — |
| " South America | — | 1002 |
| " Canada | 7358 | 29068 |
| " Other Provinces | 1658 | 13660 |
| | 10,631 | 50100 |

*Shipments from the Block House, Cow Bay, C. B.*, to the following destinations, for the week ending July 1:

| | Week. | Year. |
|---|---|---|
| Provinces | 505 | 3115 |
| West Indies | .. | 846 |
| United Stated | 1054 | 1054 |
| | 1559 | 4975 |

## COAL TRADE REVIEW.

### Duties.

*Anthracite* free, *Bituminous*, per ton of 28 bushels, 80 lb. to the bushel, 75c., gold.

All *slack*, or *culm*, such as will pass through a half-inch screen, per ton of 28 bushels, 80 lb. per bushel, 40c. gold.

Not otherwise provided for, per ton, 40c. gold.

NEW YORK, Friday Evening, July 9, 1875.

### Anthracite.

The demand for free-burning coals is very light, while for hard coals it is beyond the ability to supply. The Delaware and Hudson Canal Company and the Delaware, Lackawanna and Western Railroad Company, having largely overproduced their quota, are curtailing their production. This would be necessary even though it were not a requirement of the Combination, as the market is very well supplied with that description of coal. There will probably be a good demand for Lehigh and other hard coals for several months to come. The companies that were idle during the strike are very busy filling contracts made early in the season.

The collieries in the Lehigh Region are reported to have fully resumed work, as has also the Lehigh and Susquehanna Coal Company, in the Wyoming Region. We do not hear of a colliery that is standing idle owing to labor troubles. The Lehigh and Wilkes-Barre Coal Company are producing about 12,000 tons a day in the Wyoming Region, and 2,500 tons at Summit Hill. Their Honey Brook mines, having only started this week, are not fairly at work. The Philadelphia and Reading Coal and Iron Company have all their collieries at work, but the output is far behind the maximum. It will probably be a couple of weeks before the Lehigh Region is fairly at work.

As will be seen by our table of statistics, the output last week was 476,915 tons, or an increase of 136,732 tons as compared with the corresponding week last year. The total output since January 1st was 6,436,767 tons as compared with 9,495,997 tons for the corresponding period of 1874, showing a total decrease, this year, of 3,059,230 tons. The collieries will soon be in a condition to make up this deficiency if the market will take it, which does not appear probable.

From Philadelphia we hear:

"The United States Government has been in the market for coal within a few days, and is the purchaser of some 15,000 tons for the various navy yards on the Atlantic and Pacific coasts. Of this, over 2,000 tons were sent out last week to Honolulu, in the fine ship *Gatherer*, and about 4,000 tons more will go in a few days to California and Sitka. There are about 1,600 tons now loading for Pensacola, and 7,000 tons more are to be shipped to the navy yards at Boston, Norfolk and Portsmouth. This tends to increase the demand for vessels, for no less than fifteen vessels are to be chartered to carry 7,000 tons to the Atlantic navy yards."

### Bituminous.

The demand for Cumberland, Clearfield, Broad Top and other bituminous coals is very quiet. We learn of but few orders being taken, which, however, are at prices that have ruled for some time past. Cumberland is quoted at $4@$4 15 at Georgetown, and $4 25@$4 50 at Baltimore, with but little business doing at the higher figures. Clearfield and Broad Top coals are quoted at $5 25@$5 50 at South Amboy. As will be seen by the following tables, the output of Central Pennsylvania bituminous coals has greatly increased this year, showing that they are gaining in popularity and are destined to come into prominent competition with Cumberland and Anthracite coals. The Cumberland output shows a total decrease of 35,867 tons as compared with the first six months of last year; but the difference is rapidly being made smaller, so that by the end of the season we shall probably see an increase, especially as several of the companies are very liberally supplied with orders. We make the following comparison of the business done by the Cumberland Companies from Jan. 1st to July 4, 1874, and from Jan. 1st to July 3, 1875:

| | 1874. Tons. | cwt. | 1875. Tons. | cwt. |
|---|---|---|---|---|
| Borden Mining Company, | 61,794 | 15 | 99,077 | 01 |
| Consolidated Coal Co., | 201,650 | 17 | 202,848 | 00 |
| Black Avon Coal Co., | 18,196 | 06 | 32,472 | 03 |
| Hampshire & Baltimore Coal Co., | 32,143 | 05 | 31,607 | 15 |
| Do. (Virginia Mines) | 53,488 | 12 | 50,981 | 08 |
| George's Creek Coal & Iron Co., | 134,224 | 16 | 82,668 | 03 |
| New Central Coal Co., | 121,096 | 13 | 130,218 | 07 |
| Maryland Coal Co., | 125,516 | 15 | 94,832 | 19 |
| American Coal Co., | 102,988 | 13 | 83,157 | 11 |
| Atlantic and G. C. Co., | 56,576 | 06 | 58,395 | 09 |
| Piedmont Coal and Iron Co., | 26,942 | 16 | 32,480 | 07 |
| Scranton Mining Co., | 44,572 | 10 | 31,424 | 00 |
| Potomac Coal Co., | 37,622 | 00 | 41,186 | 00 |
| George's Creek Mining Co., | 35,202 | 03 | 39,690 | 02 |
| Franklin Coal Co., | 48,631 | 19 | 42,192 | 05 |
| New Reading Coal Co. | 5,771 | 08 | 16,420 | 14 |
| Total, | 1,105,579 | 14 | 1,069,652 | 04 |
| Decrease, | | | 35,867 | 10 |

The decrease in the shipments of some of the companies is the result of the canal opening about a month later than last year. Some companies do nearly all their business through the canal, and as others have increased their canal business this year, there has been a scarcity of cars to carry the coal to the boats although they were abundant for the Baltimore business, which has fallen off considerably.

The following is a comparison of shipments made from the following districts, from Jan. 1st, to June 28, during 1874 and 1875.

| | 1874. Tons. | 1875. Tons. |
|---|---|---|
| Huntington and Broad Top R.R.... | 120,708 | 111,078 |
| East Broad Top..... | | 23,247 |
| Snow Shoe..... | 33,726 | 36,184 |
| Tyrone and Clearfield ..... | 298,068 | 402,688 |
| Allegheny Region, Penn. R.R ..... | 115,950 | 123,707 |
| Westmoreland Gas Coals..... | 443,280 | 247,641 |

The railroad leading to the East Broad Top field was not opened until this year. Taking the out-put from this region in connection with the Huntington and Broad Top region, it will be seen that there is an increase, this year, of 13,617 tons. The Snow Shoe Region shows an increase of 2,458 tons. The Clearfield region, although it has labored under several drawbacks—first a suspension of shipments, owing to a strike of the miners, and then fires, which destroyed property, railroad bridges, etc, causing still further delay—show an increase of over one third, or 104,620 tons. The Westmoreland gas coals show a decrease of 195,639 tons, which is owing mostly to a prolonged strike of the miners, although the demand for gas coals has not been so great this year as last.

**Foreign and Gas Coals.**—There are no new orders being taken for either American or foreign gas coals. The receipts of American are entirely on contracts. The small cargo of Spring Hill (N. B) coal, advised last week, is still on the market. Foreign coals of all descriptions are dull and prices nominal. The following is a comparative statement of coal shipped from Pictou, N. S., for the seasons of 1874 and 1875 up to July 3:

| | 1874. Tons. | 1875. Tons. |
|---|---|---|
| To United States..... | 8,386 | 6,370 |
| " West Indies ..... | 1,150 | ---- |
| " South America ..... | ---- | 1,002 |
| " Canada..... | 25,150 | 29,068 |
| " Other Provinces ..... | 17,286 | 13,660 |
| Total.... | 51,972 | 50,100 |
| Decrease ..... | | 1,872 |

**Freights.**—Coastwise freights have a weaker tendency, both here and at Philadelphia. At Georgetown there are plenty of vessels, but of the larger order. At Baltimore vessels are not so abundant, while at the same time there is not much inquiry for them. The rates from Georgetown and Baltimore continue about $1 75 to Boston; $1 50 to the Sound; and $1 40 to this city. The rates paid from this city are upon the basis of $1 15 @$1 25 to Boston, and 90c@$1 to Providence. We are in receipt of revised freight circulars from the Philadelphia & Reading Railroad Company for their main and branch roads, and for the Schuylkill Canal, and from the Central Railroad of New Jersey, and the Morris Canal, all of which are arranged in our regular freight table, to be found in another column. The Philadelphia and Reading Railroad Company have issued a circular bearing date of July 1st, relative to drawbacks on the Schuylkill Canal, which contains the following:

"On and after July 5th, the Drawback of Ten Cents per ton now paid on shipment of Anthracite Coal from Schuylkill Haven and Port Clinton, that have passed Fairmount Locks to Philadelphia and vicinity, will be discontinued"

### Philadelphia Coal Trade.

July 9, 1875.

The receipts of coal at Port Richmond are very large. There seems to be a demand for all that reaches tide water, except for lump and steamer sizes, which are accumulating very fast. The Lehigh and Wilkes-Barre Coal Company has begun to ship coal lively from Bullstown.

The dealers in the city and on the line are beginning to fill up. The consumers do not seem prepared to buy nor to be scared by assertions of steady advances during the season. From past experience they ought to know that the power to advance prices exists, and ought not to entertain the least doubt about its being used. It seems as if no artificial means could create a good trade in coal during July and and August. In former times, shippers depended on contracts for those months, but there are no more contracts, or at least it is announced, and there are no more contract rates of tolls.

The supply of vessels is abundant, but rates remain at $1 60 to Boston; $1 30 to $1 35 to Rhode Island. Freights South are a little easier than one week ago, and concessions are again made to Washington and Richmond. From the last port there is a large amount of return freight to this port, and captains are anxious to go there. In the attempt to earn a dividend in a short time everything is pushed on the Reading R. R. to such an extent that the machinery cannot stand it, and several accidents have occurred at the Gordon Plane and the Mahoning Plane from forcing the machinery.

***Wholesale Prices of Anthracite Coal for July f.o.b. at the Tide Water Shipping Ports per ton of 2240 lb.***

| | Lump. | Steamer. | Grate. | Egg. | Stove. | Chestnut. |
|---|---|---|---|---|---|---|
| **Wyoming Coals.** | | | | | | |
| *Lackawanna and Scranton at Rondout and Hoboken..... | 5 00 | 5 10 | 5 20 | 5 35 | 5 80 | 4 80 |
| Pittston at Newburgh..... | 4 90 | 4 90 | 5 00 | 5 10 | 5 60 | 4 60 |
| Wilkesbarre at Port Johnston. | 5 00 | 5 10 | 5 20 | 5 35 | 5 80 | 4 80 |
| Plymouth, R. A., Act..... | .... | .... | 5 20 | 5 35 | 5 80 | 4 80 |
| Susque. Coal Co. at Amboy W.A. | .... | .... | .... | .. | .... | .... |
| Kingston at Hoboken..... | 5 00 | 5 10 | 5 20 | 5 35 | 5 80 | 4 80 |
| **Lehigh Coals.** | | | | | | |
| Old Company at Port Johnston | 5 55 | .... | 5 45 | 5 45 | 5 80 | 5 00 |
| Old Company's Room Run " | .... | .... | .. | .... | .... | .... |
| Sugar Loaf " | .... | .... | .... | .... | .... | .... |
| Lehigh Coal Exchange " | 5 55 | .... | 5 45 | 5 45 | 5 80 | 5 00 |
| Honey Brook Lehigh..... | 5 55 | .... | 5 45 | 5 45 | 5 80 | 5 00 |
| Spring Mt. C. Co. at Hoboken.. | .... | .... | .... | .... | .... | .... |
| Beaver Meadow at South Amboy | .... | .... | .... | .... | .... | .... |
| †**Schuylkill Coals at Port Richmond.** | | | | | | |
| Schuylkill white ash..... | 4 50 | 4 60 | 4 70 | 4 85 | 5 30 | 4 30 |
| Schuylkill red ash ..... | ... | .... | 4 90 | 4 95 | 5 35 | 4 30 |
| Shamokin white and red ash.. | .... | .... | .... | 5 00 | 5 30 | 4 30 |
| Lorberry..... | .... | .... | 5 60 | 5 60 | 5 60 | 4 60 |
| Lykens Valley..... | .... | .... | 6 25 | 6 25 | 6 25 | 5 45 |

Pittston coal is delivered to carts in New York or Brooklyn at 65 cents per ton in addition to the above rates.

| | Per ton. |
|---|---|
| Freight from Hoboken and Weehawken to New York.... | 40c. |
| " " Elizabethport & Port Johnston to N. York. | 45c. |
| " " South Amboy to New York..... | 50c. |

*Freight on Lackawanna coal from Rondout to New York, by boats or barges of the D. and H. Canal Co. 50c. per ton. The expense of towing vessels from New York harbor to Rondout and back will be borne by this Company.

†Freight from Port Richmond to New York (free of discharging) 85c. per ton.

***Wholesale Prices of Bituminous Coal.***

*Domestic Gas Coals.*

| Per ton of 2240 lb. | At the Shipping Ports. | Alongside in New York. |
|---|---|---|
| Westmoreland and Penn. at Greenwich, Philadelphia..... | $5 20 | $6 50 |
| " " at S. Amboy.... | 6 00 | 6 50 |
| Red Bank Cannel Pa. at Philadelphia.... | 8 00 | 8 50 |
| " " South Amboy.. | 8 50 | .... |
| " Orrel..... | 6 00 | 6 50 |
| Youghiogheny, Waverly Co., at Balt.... | 5 00 | 6 50 |
| Despard, West Va., Nominal..... | 4 75 | 6 50 |
| Murphy Run, West Va., at Baltimore... | 4 75 | 6 50 |
| Fairmount, West Va., " " ... | 4 75 | 6 50 |
| Newburgh Orrel, Md. " " ... | 4 75 | 6 50 |
| Cannelton Cannel, W. Va., at Richmond. | 9 50 | 11 00 |
| " Splint, " " | 5 00 | 6 50 |
| Peytona Cannel, " " | 9 50 | 11 50 |
| Straitsville " at Sandusky, O..... | 3 25 | 10 00 |

*Foreign Gas Coals.*

| | Sterling. | Am. cur'cy. |
|---|---|---|
| Newcastle, at Newcastle-on-Tyne..... | 10/6@12/9 | 6 50@7 00 |
| Liverpool House Orrel, at Liverpool.... | 26/ | 13 00 |
| Ince Hall Cannel " ... | 47/ | 18 00@20 00 |
| Gas Cannel " .. | 30/ | 12 00 |
| Scotch Gas Cannel, at Glasgow, nominal, | 25/ | 7 50 |
| | Gold. | |
| Block House, at Cow Bay, N. S ..... | 2 00 | 5 50 |
| Caledonia, at Port Caledonia..... | 1 75 | 5 25 |
| Glace Bay, at Glace Bay..... | 1 80 | 5 50 |
| Lingan, at Lingan Bay..... | 75 | .... |
| Sydney, International and Reserve mines, at Sydney..... | 2 00 | 5 50 |
| Pictou, Albion & Vale mines, at Pictou. | 2 25 | 5 75 |

*Steam and House Coals.*

| | | |
|---|---|---|
| Broad Top, at the mine, $1 25; at Amboy | 4 75@5 00 | 5 25@5 50 |
| Cumberland, at Georgetown and Alexandria, Va..... | 4 00@4 25 | ....@.... |
| Cumberland, at Baltimore..... | 4 15@4 50 | 5 75@6 25 |
| Clearfield, "Derby," "Kittanning," "Sterling," "Sonman," and "Eureka," at the mines, $1 25; at Greenwich, Phil..... | 4 60 | 5 65 |

***Retail Prices in New York.***

*Anthracite*

| Per 2000 lb. | Grate and Egg. | Stove. | Chestnut. |
|---|---|---|---|
| Pittston coal, in yard..... | $6 20 | $6 40 | $5 60 |
| *Lackawanna coal, delivered..... | 6 75 | 7 00 | 6 25 |
| Wilkes-Barre, " ..... | 6 50 | 6 75 | 6 00 |
| Lehigh & Locust Mountain, del'd.. | .... | .... | .... |
| Schuylkill Red Ash, del'd..... | .... | | |

The Cost of delivering Pittston coal ranges from 40 cts. to $1 per ton, according to distance from the yard.

* Lackawanna grate is quoted 25c. per ton less than egg.

*Bituminous.*

| | |
|---|---|
| Liverpool House Orrel, delivered, per ton of 2000 lb. | $23 00 |
| Liverpool House Cannel " " " | .... 25 00 |
| American Sterling " " " | .... 13 50 |
| American Orrel " " " | 15 00@16 00 |
| Red Bank Cannel " " " | ..... 14 00 |
| Cumberland " " " | ..... 9 00 |

### Baltimore, Md. July 5, 1875.

Reported by our Special Correspondent.

ANTHRACITE.

Wholesale or Trade Prices per 2240 lb.

| *Wilkes-Barre "Lee" or "Diamond," Pittston and Plymouth.* White ash. | In cars at depot. | By boats afloat. |
|---|---|---|
| Lump and steamboat..... | $4 85 | $4 65 |
| Broken..... | 5 36 | 5 21 |
| Egg..... | 5 62 | 5 47 |
| Stove..... | 5 87 | 5 72 |
| Nut..... | 5 02 | 4 87 |
| *Shamokin, (red or white ash), and "Boston," freeburning white ash,* | | |
| Egg..... | 5 65 | 5 50 |
| Stove..... | 5 85 | 5 70 |

| | | |
|---|---|---|
| *Lykens Valley, red ash,* | | |
| All sizes | 6 05 | 5 72 |

From wharf or yard, wholesale, 50@75c. additional.
By retail, all kinds and sizes, per 2240 lb. $6 75@7 75.

BITUMINOUS.

| | | |
|---|---|---|
| George's Creek and Cumberland f. o. b. at Locust Point | 4 35 | 4 50 |
| West Virginia f. o. b. at Locust Point | | 5 50 |
| Youghiogheny Gas, f. o. b. at Locust Point | | 5 50 |
| Swanton Coal, George's Creek | | 4 40 |

### Boston. July 3, 1875.

Reported by our Special Correspondent.

CARGO PRICES TO TRADE.

| | | | |
|---|---|---|---|
| Lingan coal | $ 5 75 | Westmoreland and Penn. | 7 25 |
| Caledonia | 5 00 | Waverly Co. Youghiogh'y. | 7 25 |
| Pictou | 6 15 | Cannelton Cannel | 11 75 |
| Block House | 5 60 | Cumberland | 6 25@ 6 50 |
| Red Bank Cannel | 10 00 | Anthracite | 6 50@ 7 25 |
| Glace Bay | 5 00 | " retail | 7 50@ 8 00 |
| Sydney | 7 00 | | |

Total receipts for the week—14,427 tons domestic and 2,467 foreign, against 41,111 tons domestic and 291 foreign for the corresponding week last year. Total receipts since Jan. 1, 309,712 tons domestic and 7,506 tons foreign, against 406,333 tons domestic and 13,838 tons foreign for the same time in 1873—*Commercial Bulletin.*

### Buffalo, N. Y. July 5, 1875.

Reported by our Special Correspondent.

Prices free on board vessels here are as follows:

ANTHRACITE.

| | Afloat. | F. O. B. Vessel. | Retail. Deliv'd. |
|---|---|---|---|
| Grate | .... | $6 20 | $7 00 |
| Egg | .... | 6 20 | 7 00 |
| Stove | .... | 6 65 | 7 45 |
| Nut | .... | 6 40 | 7 20 |

### Chicago, Ill. July 5, 1875.

Specially reported by Messrs. RENO & LITTLE, Coal Merchants.

Retail prices per ton of 2000 lb. delivered to buyer.

| | | BITUMINOUS. | |
|---|---|---|---|
| Lehigh Lump | $10 00 | Briar Hill and Erie | @ 7 00 |
| Lehigh grate and egg | 10 00 | Walnut Hill (W.Va) | @ 6 00 |
| Lehigh stove and chest. | 10 50 | Midway (West Va.) | @ 6 00 |
| Lackawanna, Wilkes-Barre and Pittston* | | Cannel | @ 9 00 |
| | | Blossburg | 8 00 |
| Grate and egg | 9 00 | Indiana Block | 5 50 |
| Stove and chestnut | 9 50 | Hocking "Brooks" | 6 00 |
| | | Wilmington and Illinois | 4 50 |

* 50 cents off these prices for car load lots to country dealers and manufacturers.

### Cincinnati, O. July 5, 1875.

Reported by our Special Correspondent.

| Per ton of 2000 lb. | Bush. | Ton. |
|---|---|---|
| Youghiogheny, or Pittsburgh, afloat | 10c. | |
| Pomeroy coal | 6½c. | |
| Cannel coal | 16c. | |
| Semi Cannel | 9½c. | |
| The following are the retail prices delivered: | | |
| Youghiogheny | — c. | $3 35 |
| Pomeroy | — c. | 2 75 |
| Cannel | — c. | 5 50 |
| Kanawha Semi Cannel | — c. | 3 35 |
| Anthracite | | 9 50@10 |
| Foundry coke | — | — |
| Coke, hard and soft | 10 c. | — |

### Cleveland, O. July 6, 1875.

Reported by our Special Correspondent.

Per ton of 2000 lb. f. o. b. vessels.

| | | | |
|---|---|---|---|
| Youghiogheny, lump | $4 40 | Columbiana | $3 00 |
| Youghiogheny, nut | 3 50 | StripVein & Steubenville | 3 30 |
| Briar Hill, according to quality | $3 05 to 4 00 | Mountain Blossburgh (blacksmith) | 5 40 |
| Massillon | 3 25 | American Cannel Coal Co.'s Cannel | 4 40 |
| Hocking Valley | 3 35 | | |
| Straitsville | 3 35 | | |

Prices remain unchanged The miners have resumed work in the Mahoning and Tuscarawas Valley, so far as mine owners desire and the demand for coal warrants. Vessels for western shipments are rather scarce. There being no returns of grain or other freights, many vessels therefore have laid up. Coal freights west have an upward tendency. Business generally very quiet.

*The Manufacturing and Trade Review* of July 6, says: "The coal market continues steady, without change of prices. There is considerable inquiry for lots for shipment by lake, and the season's trade in this direction has set in with considerable activity. The Mahoning mines having resumed operations the sources of supply are ample for every emergency, the other districts still remaining in competition."

### Connellsville, Pa.

JULY 7, 1875.

COKE TRADE.—The shipments by the P. W. and B. R ilroad for the week ending July 3d, show a decrease of 157 cars over the previous week, and 295 in two weeks. This can be accounted for by the resumption in the anthracite regions, although the falling off in eastern shipments are not as large as was expected. The price is somewhat lower, and coke can be bought at 2¾c., as easy as at 3c. two weeks ago. Nearly all the ovens are in full blast, and large quantities of coke are being made. —*Tribune.*

### Detroit, Mich. July 5, 1875.

Specially reported by Messrs. ROBINSON & KEYS, Dealers in all kinds of coal.

Per ton of 2000 lb.

| | | | |
|---|---|---|---|
| Lehigh Lump, per ton. | $10 50 | Blossburg | 8 50 |
| Lehigh " prep.sizes. | 10 00 | Briar Hill | 7 50 |
| Wilkes-Barre, Grate and Egg | 9 00 | Willow Bank | 7 00 |
| | | Erie | 7 50 |
| Wilkes-Barre, Stove and Nut | 9 50 | Massillon | 7 00 |

### Erie, Pa. July 5, 1875.

Reported by our Special Correspondent.

Wholesale, per ton of 2000 lb. Bituminous f. o. b.

| | | | |
|---|---|---|---|
| Briar Hill lump | $4 00 | Beaver lump | $4 00 |

### Indianapolis, Ind. July 5, 1875.

Specially reported by Messrs. COBB & BRANHAM.

Wholesale on board cars, and retail delivered to consumers. Per ton of 2000 lb., bushel of 70 lb.

We note a decline in Highland Grate, and an advance of 10c. a ton on Anthracite at wholesale.

BITUMINOUS.

| | | | |
|---|---|---|---|
| Sand Creek, per ton | $3 25 | Peytona cannel, per ton. | 7 25 |
| White River, " | 3 00 | Indiana Cannel | 6 50 |
| Brazil Block, " | 2 65 | Hocking Valley | 4 25 |
| Highland, grate, " | 2 25 | Youghiogheny | 4 75 |
| Block coal, nut, per car. | 18 00 | Blossburg (smithing) | 6 50 |
| Highland " " | 18 00 | Piedmont " | 6 50 |
| Block Slack " | 17 00 | Gas coke, per bushel | 10 |

ANTHRACITE (Lackawanna and Wilkes-Barre.)

| | | | |
|---|---|---|---|
| Grate | $8 60 | Chestnut | 8 50 |
| Egg | 8 60 | Stove | 8 75 |

Owing to the Miner's strike there is no Lehigh coal in this market.

Retail, per bushel, delivered.

| | | | |
|---|---|---|---|
| Sand Creek | 15c. | Block Nut, steam | 8 |
| White River | 14 | " Slack, " | 7 |
| Brazil Block | 14 | Peytona Cannel | 28 |
| Highland grate | 14 | Indiana " | 24 |
| Block Nut, domestic use | 12 | Youghiogheny | 20 |
| Highland Nut, " | 12 | Blossburg | 26 |
| " " steam | 8 | Piedmont | 26 |

GAS COKE(measured.)

| | | | |
|---|---|---|---|
| Crushed | 15c. | Lump | 12c. |

ANTHRACITE.

All sizes (Wilkes-Barre and Lackawanna), $10 per ton.

### Louisville, Ky. July 5, 1875.

Specially reported by Messrs. BYRNE & SPEED.

A few days since, the price of coal advanced one and two cents per bushel; and is now held as follows, with very little activity in the market:

| | | | |
|---|---|---|---|
| Pittsburgh, in river, per bushel | 11c. | Kentucky (E. and P. RR) | 9c. |
| Screened Raymond City. | 9c. | Kentucky nut, per load | |
| Pine Hill | 9½c. | " Slack, " | |
| Buckeye Cannel | 20c. | City-made Coke, per bus. | 10c. |
| Peytona " | 22c. | Pittsburgh, retail, " | 14c. |
| Nut and Slack | | Kentucky on cars, at wholesale per bushel | |
| Pine Hill nut | | Anth., per ton, to $ | |

### Milwaukee, Wis. July 5, 1875.

Specially reported by Messrs. R. P. ELMORE & Co.

Retail price per ton of 2000 lb.

| | | | |
|---|---|---|---|
| Lehigh Lump | $10 00 | Scranton | $9 50 |
| Lehigh Prepared | 10 50 | Briar Hill, select | 8 00 |
| Lackawanna | 9 50 | Blossburgh | 8 00 |
| Pittston | 9 50 | Pittsburgh | 7 00 |

### New Orleans, La. July 3, 1875.

We have still a very quiet market to report. The stock of bituminous coal afloat on the 1st of this month was 167 boats and three barges. Arrivals during June, 10 Boats. Consumption, 19 boats and 1 barge.

The market is almost bare of Anthracite Coal and early shipments will find ready sales.

| | |
|---|---|
| Pittsburgh coal, retail, per bbl | 65c. |
| " wholesale | @45c. |
| " steamboats, per box | 50c. |
| " to manufacturers, per bbl | 60c. |
| " shipments, per hhd | $6 00 |
| Anthracite, wholesale, per ton | none. |
| " retail, " | $12 50 |
| Virginia Cannel, per bbl | 90c. |
| Scotch " " | |
| St. Bernard, wholesale, per bbl | 37½c. |
| " retail, " | 60c. |

### Pittsburgh, Pa. July 5, 1875.

Per ton of 2000 lb. and Bushel of 76 lb.

| | | | |
|---|---|---|---|
| Youghiogheny coal, ton, | $2 00 | Pittsburgh retail deliv'd. | |
| " coke, " | 2 50 | per bushel | 9@10c. |
| Connellsville coal, " | 2 50 | Anth'cite on cars Lehigh | $7 75 |
| " coke | $2 25@2 75 | " " Wilkes-Barre | 6 75 |
| Pittsburgh coal | 1 85 | | |

Twenty-five to fifty cents per ton additional for delivery.

The *American Manufacturer* of July 7th says:

COAL.—The coal trade continues very quiet and no improvement need be looked for until navigation is resumed. There is a very large quantity here loaded in boats and barges ready to move as soon as there is sufficient water to let it out, and operators, as might be expected are very anxiously waiting for a rise, as they are desirous of converting their black diamonds into greenbacks, which they cannot accomplish until they can get their coal to market. The stock of coal afloat at Cincinnati and Louisville is reported light, but the Southern markets are said to be pretty well supplied.

COKE.—As noted in our last review trade is falling off, which may be attributed to the ending of the anthracite coal strike, where during the lock-out coke was substituted largely in place of coal; however, business is about all it usually is at this particular time, and about all that can reasonably be expected under existing circumstances. Quotations may be fairly given at $2 50@$2 75 per ton, delivered free on cars in Pittsburgh. There is a large amount of coke loaded in boats here ready to move as soon as there is water, and a large proportion is sold on contracts and is waiting only a resumption of navigation in order to be delivered One operator alone reports having a quarter of a million bushels loaded ready to move as soon as the water will permit.

### San Francisco.

From the *Commercial Herald* of June 24, 1875.

Imports from January 1st to June 15:

| | | | |
|---|---|---|---|
| Anthracite tons | 6,159 | English, tons | 22,608 |
| Australian, tons | 44,278 | Vancouver Island, tons | 27,166 |
| Coos Bay, tons | 16,552 | Rocky Mountain, tons | 22 |
| Cumberland, tons | 5,039 | Seattle, tons | 20,761 |
| Mt. Diablo, tons (5 mos) | 65,515 | Bellingham Bay, tons | 5,670 |

"The ship *Champlain* from New York, lost off the Farallones, had but 231 tons Anthracite on board. Imports for the week embrace the following: per *City of Hankow* from Sydney, 700 tons coal, and 1,000 tons shale; the *Amethyst*, 500 tons Bellingham Bay: the *Nearchus*, from New York, had only 189 tons Anthracite; the *Arkwright*, from Nanaimo, had 1,971 tons Bituminous: the *Emily Farnham* from Baltimore, 1,500 Cumberland: the *Eastport* and other vessels from Coos Bay about 1,000 tons. The market for nearly all kinds is very sluggish and prices favor the buyer for every description, save Lehigh and Pittston which are scarce, high, and much wanted. Cumberland continues very plentiful. We quote Bellingham Bay at $8 50: Coos Bay, $10; California Mt. Diablo Steam, $6 25@8 25 for fine and coarse respectively. Cargoes of Scotch and English Steam to arrive may be quoted at $9; Cumberland, $18@20; Nanaimo, $9 50@10; Seattle, $9 25@10; Sydney, $9@9 25 by the cargo."

### Toledo, Ohio. July 5, 1875.

Specially reported by Messrs. GOSLINE & BARBOUR.

Per ton of 2000 lb. on cars.

| | | | |
|---|---|---|---|
| Hocking Valley | $3 40 | Massillon | 4 20 |
| Straitsville | 3 40 | Youghiogheny | 5 00 |
| Shawnee | 3 40 | Blossburg | 7 50 |
| " nut | 2 90 | Cumberland | 7 50 |
| Briar Hill | 5 50 | Connellsville coke | 7 00 |

ANTHRACITE.

| | | | |
|---|---|---|---|
| Grate, screened | $7 75 | Stove, screened | $8 25 |
| Egg, " | 7 75 | Chestnut " | 7 75 |
| Lehigh Lump | 9 50 | | |

40 cents to $1 per ton additional for delivery at retail.

### Halifax, N. S. July 5, 1875.

Prices per ton of 2240 lb. in gold.

| | | | |
|---|---|---|---|
| Sydney (old mines) | $4 00 | Little Glace Bay | 3 50 |
| Gowrie | 3 50 | Blockhouse | 3 75 |
| Victoria | 3 50 | Albion (at Railroad) | 4 00 |

### Montreal. July 5, 1875.

Specially reported by Messrs. ROBERT C. ADAMS & Co.

Wholesale per ton of 2240 lb.

| | | | |
|---|---|---|---|
| Scotch Steam | $5 50 | Cape Breton Steam | $4 50 |
| Pictou " | 5 00 | Newcastle Smiths | 7 00 |

Anthracite at retail, per 2000 lb., delivered.

| | | | |
|---|---|---|---|
| Egg | $7 50 | Chestnut | 7 00 |
| Stove | 7 75 | | |

## Rates of Transportation on Anthracite Coal to Tide Ports.

| Lehigh and Wyoming Coals. per ton of 2240 lb. | From Penn Haven. | From Mauch Chunk. | From Hazleton* | From Upper Lehigh. | From Ashley and Sugar Notch. |
|---|---|---|---|---|---|
| To ‡ Newark, N. J., via Central Railroad of New Jersey | 2 54 | 2 40 | 2 86 | 3 18 | 3 39 |
| ‡ Mauch Chunk, Pa., via Central Railroad of N. J. | 14 | .. | 56 | 51 | 72 |
| ‡ Philipsburg, N. J. | 96 | 82 | 1 34 | 1 44 | 1 65 |
| ‡ Elizabethp't, Port Johnston, Hoboken and South Amboy, N. J., shipping and wharfage 35c. add. | 2 18 | 2 04 | 2 80 | 2 82 | 3 03 |
| High Bridge, N. J. | 2 40 | 2 20 | 2 80 | 2 79 | 3 09 |
| Somerville and Raritan, N. J | 2 80 | 2 60 | 3 20 | 3 19 | 3 49 |
| Elizabeth, Cranford, Westfield & Elizabethport, for consumption, | 2 95 | 2 75 | 3 35 | 3 34 | 3 64 |
| ¶ Jersey City, N. J., and New York, via Morris Canal | 2 85 | 2 35 | 3 17 | 3 24 | 3 54 |
| Andover, via Delaware, Lackawanna and Western RR | 3 30 | 3 10 | 3 70 | 3 69 | 3 99 |
| § Trenton, Somerset Junction and Greensburg, via P. RR. Belvidere Division | 2 65 | 2 45 | 3 05 | 3 04 | 3 34 |
| Trenton, for shipment, including shipping and wharfage | 2 11 | 1 95 | 2 45 | 2 46 | 2 76 |

From Mauch Chunk to New York (towing limits) and Jersey City† via Lehigh Valley RR. and Morris Canal .. $2 34

From Phillipsburg, N. J., to Hoboken (for consumption) via Delaware, Lackawanna and Western RR..... 1 80

* Rates on line coal from Hazleton are 10c. per ton above these figures.

‡ The cost of unloading is to be added to these rates. No charge less than 4cc. per ton will be made for any distance. Tolls from Mauch Chunk to Phillipsburg for way points will be $11 15 per ton.

§ Twenty cents per ton less when five cars at a time to one party. Provided that where the reduction makes the rate $1 a ton, or less, the rate will be $1.

¶ 20 cents per ton additional for transferring coal from boat to boat, and 30 cents per ton for reshipment of same from wharves.

† Transportation on Coal destined for re shipment from this point is 20c. less than above rate.

| Schuylkill Coals. per ton of 2240 lb. | From Pine Grove. | From Tamaqua. | From Port Carbon. | From Mount Carbon. | From Schuylkill Haven. |
|---|---|---|---|---|---|
| To *Port Richmond*, for shipment, via P. & R. R. R., Main Line | 2 12 | 2 07 | 2 00 | 1 99 | 1 92 |
| *Philadelphia*, Retail yards | 2 22 | 2 17 | 2 10 | 2 09 | 2 02 |
| *Harrisburg*, via Lebanon Valley Branch | 1 35 | 2 02 | 1 95 | 1 94 | 1 87 |
| *Allentown*, via East Pennsylvania Branch | 1 70 | 1 65 | 1 58 | 1 57 | 1 50 |
| *Lancaster*, and Points on Lancaster Branch, via R. & C. R.R | 1 82 | 1 77 | 1 70 | 1 69 | 1 62 |
| *Dauphin*, via Schuylkill and Susquehanna Branch | 85 | .... | 1 43 | 1 42 | 1 35 |
| *Slatedale Junction* via Berks and Lehigh Branch | 1 88 | 1 83 | 1 76 | 1 75 | 1 68 |
| *Lebanon*, via Lebanon and Tremont Branch | 96 | .... | .... | .... | .... |

From *Tamanend* to *Catawissa*, via Catawissa and Williamsport Branch Railroad ..... 94
From *Tamanend* to *Williamsport*, via Catawissa and Williamsport Branch Railroad ..... 1 39
* From *Port Clinton* to *Philadelphia* v a Schuylkill Canal, including freight and char s for the use of cars and barges, and for tolls (exclusive of cost of unloading)... 1 69
* From *Port Clinton* to *New York*, within towing limits, " 53d street ..... 2 71

For shipment via Main Road or Schuylkill Canal, one and one-half cents per ton per mile, and two cents per ton additional, to Port Carbon, Mount Carbon, Schuylkill Haven, Pine Grove, Tamaqua, or Port Clinton, for Canal, as the case may be.

Coal sent to points on the Catawissa and Williamsport Branch will be charged one and one-half cents per ton per mile, and two cents per ton additional to Tamanend.

The rates of freight and tolls on lump and steamboat coal will be twenty per cent., and on broken coal will be ten per cent. less than the above rates.

* The charge from Schuylkill Haven to Philadelphia or New York is 11c. additional to these rates.

On and after July 5th, the Drawback of ten cents per ton now paid on shipments of Anthracite Coal from Schuylkill Haven and Port Clinton, that have passed Fairmount Locks to Philadelphia and vicinity, will be discontinued.

**Freights.**

Per ton of 2240 lb.

| PORTS. | From Philadelphia. | From Baltimore and Georgetown. | From Elizabethport, Port Johnson, South Amboy, Hoboken and Weehawken. |
|---|---|---|---|
| Augusta, Me | .... | 2 00 | .... |
| Albany | .... | .... | .... |
| Amesbury, Mass | .... | .... | .... |
| Bangor, Me | .... | 2 00 | 1 20 |
| Bath, Me | .... | 1 80 | 1 20 |
| Baltimore | .... | .... | .... |
| Boston, Mass | 1 60@1 75 | .... | 110@125 |
| Bridgeport, Ct | .... | 1 50 | 80 |
| Bristol, R. I. | .... | .... | 90 |
| Derby | .... | .... | 90 |
| Dighton | .... | 1 60 | .... |
| East Cambridge | .... | .... | .... |
| Fall River | 1 35 | 1 50 | 80@90 |
| Hackensack | .... | .... | .... |
| Hallowell, Me | .... | .... | .... |
| Hartford | 1 70 | .... | 1 20 |
| Hoboken | .... | 1 30 | .... |
| Hudson | 1 00 | 1 70 | .... |
| Jersey City | .... | 1 30 | 40 |
| Lynn, Mass | 1 60† | .... | .... |
| Middletown | .... | .... | 1 10 |
| Mystic | .... | .... | .... |
| Newark | .... | .... | .... |
| New Bedford | .... | 1 60 | 90 |
| Newburyport | 1 75 | 1 80 | 125@130 |
| New Haven | .... | 1 50 | 80 |
| New London | .... | 1 50 | 80 |
| Newport | .... | 1 50 | 80@90 |
| *New York | 85† | 1 40 | 40 |
| Norfolk, Va | .... | 70 | .... |
| Norwalk | .... | .... | 1 00 |
| Norwich | 1 35 | 1 65 | 80 |
| Pawtucket | 1 50 | ... | ‡90@100 |
| Philadelphia | .... | 85 | 75 |
| Portland | .... | 1 75 | 1 25 |
| Portsmouth, N. H. | 1 60 | 1 80 | 1 30 |
| Providence | .... | 1 50 | 90 |
| Petersburg, Va | .... | 90 | .... |
| Portsmouth, Va | .... | .... | .... |
| Poughkeepsie, N. Y. | .... | .... | .... |
| Richmond, Va | 85 | .... | .... |
| Rockport | .... | .... | .... |
| Saco | .... | .... | 1 00 |
| Sag Harbor | .... | 1 75 | 1 00 |
| Salem | 1 65 | .... | 110@125 |
| Salisbury Pt., Mass., & towing | .... | .... | 1 40 |
| Savannah, Ga | .... | .... | .... |
| Stamford | .... | .... | 85 |
| Stonington | .... | .... | .... |
| Taunton | .... | .... | 85 |
| Trenton, N. J. | .... | .... | 85@1 00 |
| Troy | .... | .... | 1 25 |
| Warren, R. I. | .... | .... | 90 |
| Washington, D. C. | .... | .... | .... |
| Wareham | .... | 1 65 | .... |
| Weymouth | .... | 1 80 | .... |
| Wilmington, Del | .... | 90 | .... |
| Wilmington, N. C. | .... | 1 50 | .... |

* The rate by barge from Baltimore to this point is $1 55.
† And discharging. ‡ And towing.

**Erie Canal.**

per 2240 lb.

Hoboken to Buffalo .....75c.
" Rochester .....70c.
" Oswego .....65c.

The above rates are exclusive of harbor towing, trimming, unloading and tolls.

**Delaware and Raritan Canal.**

Tolls and Steam Towage.

Per 2240 lb. Cargoes to exceed 110 tons.

From Fairmount to New York, towing limits within 53d st. 69c.
" Greenwich " Bituminous ..... 64c.
" Lambertville " Anthracite ..... 57c.
" Port Richmond " ..... 63c.
" " " " Semi-bituminous coal, 63c.
" Philadelphia " Cumberland " 58c.
" Trenton " Anthracite " 37c.

CANAL TOLLS, exclusive of towage, Bordentown to New Brunswick, when towed by the Company's Steam Tugs:
For Anthracite Coal ..... 35c.
Bituminous and Semi-bituminous Coal...35c.

OFFICE OF THE PA. & N. Y. R. R. Co., }
Bethlehem, July 1st, 1875. }

On and after this date, rate on coal to Buffalo, Rochester, and points west of Salamanca on Atlantic & Great Western, or Erie Railways; Watkins, for shipment, on Northern Central Railway; Ithaca, for shipment, on Ithaca & Athens R. R.; Auburn, for New York Central R. R.; Weedsport, for Erie Canal; Sterling, for Lake Onta io Shore R. R.; and Fair Haven, on Southern Central R. R.; will be advanced on this R ad 3 cents per Ton, making the rate between C xton and Waverly, on through Coal, via Erie Railway, including transhipment at the latter place, $1,49 per ton,

ROBERT H. SAYRE, President,

## Freights on Bituminous Coals from the Mines to Tide-Water Shipping Ports.

*From the Mines to Cumberland and State Line* (say an average of 20 miles) the charge is 3 cents per ton of 2240 lb. per mile.

*From State Line to Amboy* (346 miles) $3 75 per ton of 2000 lb. On coal shipped beyond this point there is a drawback of 50 cents per net ton,

*From Cumberland to Baltimore* (178 miles) $2 31 per ton of 2240 lb., or $2 02 per net ton, and 4 cents per gross ton for use of cars.

*From Cumberland to Georgetown,* (152 miles) by canal, $1 25. Tolls, 51 cents.

*From t e Min s to Piedmont,* (from 4 to 10 miles) 5 cents per ton of of 2240 lb. per mile on distances less than 5 miles, and 4 cents per ton per mile on distances not over 10 miles.

*From Piedmont to Baltimore,* (206 miles) $2 69 per ton of 2240 lb., or $2 40 per net ton.

*From a y point in the Kanawha Valley to the Jam s River wharves below Richmond,* (say 350 miles) by C. and O. R.R., including terminal charges, per ton of 2240 lb. For Cannel coal, $4 50.

*Do do.,* for Semi-Cannel or Splint, per ton of 2240 lb., subject to rebate on shipments of 5000 tons or more, $3 65.

*From Irwin to W. Phila.* (say 332 miles) per P. R R. Penn. Westmoreland gas coal, per ton 2000 lb .....$4 75

*From Osceola to W. Phila* (say 248 miles) per T. & C. R. R., per ton bituminous coal of 2000 lb., &c. extra for cross roads. Drawbacks, according to destination of coal ..... 3 55

*From Fairmount and Clarksburg to Baltimore* (say 300 miles) via B. & O. R. R. including loading, per 2000 lb ..... 4 75
On through coal after deducting drawback..... ....

*From Richmond, Va., to New York,* via vessel, 392 miles per 2240 lb.. 1 60
" " " *Boston,* about 650 " " " ..... 2 00
" " " *Philadelphia,* 292 " " " ..... 1 25

*From the Mines to Richmond,* via James River and Kanawha Canal, 15 miles ..... 15

## THE BRITISH COAL AND IRON TRADES.

June 26, 1875.

*North of England.*—The demand for all descriptions of coal continues very dull, and prices are barely sustained. The following are the prices f. o. b. at the shipping ports: Steam coal, 12/@16/; household, 14/@16/; unscreened ditto, 12/; gas coal, 8/ 6d@11/ per ton. Coke ranges from 13/ 6d@16/ at the ovens, and puddling coal 5/@6/ at the pits. The iron trade is in a very depressed condition, and it is feared that it will be some months before an improvement will take place. The heavy failures that have occurred during the last month, although not directly affecting the iron trade of this district to a great extent, have resulted in creating a great lack of confidence; and although prices are very low, but little business is being done. No. 1 Foundry pig iron is quoted at 58/@59/; No. 3, 52/@52/ 6d.; and No. 4 forge, 50/@50/ 6d. net cash. These prices are for prompt delivery, while for future delivery lower quotations are given. One or two furnaces have blown out, but it is believed that stocks will show a considerable increase when the returns are made up at the end of the month. The finished iron trade is worse than that of pig iron; few orders are coming to hand, and those received are at unremunerative prices. If an improvement in the demand and prices does not take place soon a number of mills and forges will have to close. The employers do not appear to realize the situation, as they are making considerable opposition to the minimum of wages proposed by the employers. Prices remain nominally unchanged. Rails are quoted at £7 2/ 6d@£7 5/ for ordinary sections; common bars, £8; and puddled bars £5 5/.

*Barrow-in-Furness.*—There is considerable depression in all departments of the iron trade. The recent failures have created considerable uncertainty as to the future of the trade, and as a consequence the demand will be quite limited until confidence is regained. Prices, however, have been fairly maintained as follows: Best hematite ore, at the pits, 15/ 6d@16/ per ton; No. 1 Bessemer pig iron, 82/ 6d at the works; No. 2, 80/; No. 3, 77/ 6d; ordinary forge, 77/ 6d per ton. The amount of manufactured material being produced is fully one-third less than during the early part of the year, and the bulk of it is being taken by foreign countries. It is rumored that another large order for steel rails has been received from Russia, to be completed during the present season. The shipbuilding, engineering and iron founding trades are very inactive; most of the orders are worked up and new ones are not coming to hand.

*Yorkshire and Derbyshire.*—There is but a very limited demand for the various descriptions of coals. Many collieries are only working from one-half to two-thirds time, and as a consequence the cost of producing a ton of coal is so much increased that there are no profits left to the coal owners, while in many cases there are losses. The collieries of the South Yorkshire district are laboring under disadvantages, owing to the high rates of freight charged by the Great Northern Railroad. The present rate to London is 8/ 11d per ton, including city dues, while coal is taken from Newcastle-on-Tyne to the Thames, by steamers, at 4/ 6d per ton, which shows a difference of 3/ 4d per ton in favor of Newcastle coals. The receipts of the railroad company have fallen off very much owing to their late policy, and they are now trying to remedy matters by announcing a small reduction in freights to take place 1st prox. Steam coal has improved of late, and the demand for shipment from Grimsby has increased. It is expected that a revision of wages will be made 1st of August. Two or three collieries are idle, having trouble with their men. Considerable quietness reigns in many departments of the manufacturing iron trade, but as the government has been a very good customer for plates, this department has been fairly active. Bessemer steel is in good request, and there are prospects that business in this department will continue good throughout the year.

*Lancashire and Cheshire.*—The demand continues quiet for nearly all classes of coal. For gas coals there are a good many inquiries, but the shipping trade is quiet. Stocks are accumulating in this district, but they are not nearly so large as a year ago. The average pit prices in the Wigan district are as follows: Arley mine coal, 12/@13/; Pemberton four-feet, 11/@12/; common coal, 8/ 6d@9/; burgie, 6/ 6d@7/; and good slack, 5/ per ton. There are no signs of an improvement in the shipping trade at Liverpool. Buyers are waiting for the turn of the half-year, expecting lower prices which it is rumored will be in existence after July 1st, when it is expected that house coals will be sold at 21/. At the usual weekly meeting at Manchester but little iron changed hands. There is considerable underselling taking place. No. 3 Cleveland pig is delivering into this district at 61/@63/ per ton. In manufactured iron there is a tolerably fair demand for hoops, sheets and plates. Ordinary bars are still quoted at £8 10/ per ton. Some of the rolling mills are not in a position to book orders for early delivery, but there are nevertheless a good many complaints of slackness.

*South Staffordshire.*—The Cannock Chase coalmasters have this week made reductions ranging from 1/@3/ on prices of coal and slack. Deep coal which was last quoted at 15/ is now quoted at 13/. It is thought that a reduction of wages will have to follow this reduction in the prices of coal. The iron trade is quite languid. Common cinder pigs are quoted at £3@£3 5/; mixed cinder and mine, £3 17/ 6d; and best native all-mine, £5@£5 5/ per ton. Lilleshall cold-air pigs are firm at £6 10/. Several blast furnaces in this district are damped down, and unless trade revives soon, they will be put out altogether. The number actually lighted is eighty, but only seventy-four are in blast. In the finished iron department sheets are in moderately steady demand, although the buoyancy in this direction is not so great as last noted. For all other descriptions the inquiry is decidedly flat, and prices for the commoner qualities show a good deal of irregularity. Low qualities of unmarked bars are offered at £8 7/ 6d@£8 10/ per ton, and a fair reliable bar is to be had at £9 10/. The ironworkers are objecting to lowering the minimum rate of wages from 9/ 6d to 8/ 6d. Most of the works are working at no profit, or a loss, and it is inevitable that a reduction in wages must be insisted upon or the works closed.

*Monmouthshire and South Wales.*—The demand for coal is constantly increasing, but it is not at all in proportion to the ability to produce. Large quantities are daily sent to Cardiff and Newport, and the Spanish and other Continental markets are taking considerable quantities; but the exports are considerably behind what they were last summer. House qualities are quoted at 13/@14/ f. o. b. at the shipping ports, and steam 13/@13/ 6d. per ton. The Great Western Railway Company will soon take hold of the Monmouthshire Railway and Canal Company's line, guaranteeing the shareholders 6½ per cent., and a division of the surplus profits, if any. This will decrease the opposition now existing and is not likely to benefit the coal owners. The iron trade continues dull, with but few orders being received. The late failures, in addition to rumors of the unsound condition of many of the iron works, is unsettling this trade to a great extent. Before the strike was ended, the opinion was expressed that business could not revive until a greater reduction of wages was submitted to than the one proposed, and it appears that it is being realized, as makers are unable to bid sufficiently low to secure business.

*Scotland.*—Our markets have not been at all affected by the commercial failures in London and the provincial towns. One or two Glasgow houses were to some extent involved in the collapse of Messrs. WESTHEAD & Co., of Manchester, and Messrs. BORTHWICK, YOUNG & Co., of London, but no stoppages have taken place here, and our manufacturers are confident that no evil influences will be experienced by them. The present large and cheap supply of money has done much to allay any excitement which was created. During the greater part of the week the iron market has been steady, and prices better than those which prevailed the previous week. The warrant market on Friday was firm, with a good business, and the same may be said of it on Monday, prices having advanced on the two days about 1/ 6d. On Tuesday there was less doing, with prices between 59/ 3d. and 59/ 9d. In most cases the principal makers' brands have increased in price since last week, as the following quotations show:—G. m. b. at Glasgow, No. 1, 61/6d.; No. 3, 60/; Gartsherrie, 66/6d. and 61/6d.; Coltness, 68/6d. and 64/; Summerlee, 65/6d. and 61/; Langloan, 66/ and 61/; Carnbroe, 63/ and 61/; Monkland, 61/6d. and 60/; Clyde, 62 and 60/; Govan, at Broomielaw, 61/6d. and 61/; Calder, at Port Dundas, 67/ and 62/6d.; Glengarnock, at Ardrossan, 69/ and 61/6d.; Eglinton, 61/ and 59/; Dalmellington, 60/ and 59/; Carron, at Grangemouth, 70/; Shotts, at Leith, 66/ and 63/; Kinneil, at Bo'ness, 61/6d. and 59/6d. The shipments of pig iron from Scotch ports for the week ending the 19th inst. amounted to 11,118 tons, showing the large increase of 5,643, as compared with those of the corresponding week of 1874, and there is a total increase in the exports, since Christmas, of 58,179 tons. The imports of Middlesbrough pigs at Grangemouth for the week were 2 035 tons, a decrease of 325 on those of the corresponding week of last year. The manufactured-iron trade is yet much less active than could be desired, but some of the malleable works are better supplied with work, and the

greater number of the foundries continue well employed. Though many colliers have left the mines and gone to other employments, their absence has so far had no appreciable effect on the supply of coals, which is much greater than is required. The demand just now is very inactive, especially for steam coals, and a further small reduction has been made on the prices all round. Household coals sell at from 8/ to 10/ per ton; smithy, 14/; Wishaw main, 7/3d. to 8/; splint, 8/ to 8/9d.; and steam, 8/3d. to 10/. The shipping trade is anything but lively.

## Import Duties.

The following are the duties in Gold:

*Flat Iron*, not less than 1, nor more than 6 inches wide, nor less than ⅜, nor more than 2 inches thick. *Round Iron*, not less than ¾, nor more than 2 inches in diameter, and *Square Iron*, not less than ½, nor more than 2 inches square per pound 1 c.

*Flat, Round or Square Iron*, of larger or smaller sizes than the above mentioned, per lb.....1¼c.

*Provided*, that all iron in slabs, blooms, loops, or other forms, less finished than bars, and more advanced than pig iron, except castings, shall pay the same as iron in bars.

*Provided*, that none of the above iron shall pay less than 35 per cent.

*Railroad Bars—Iron*.....70c. per 100 lb.
*Railroad Bars—Steel*.....$1.25 per 100 lb.
*Boiler plates*, or other plate iron not less than 3-16 of an inch thick, per lb..... 1¼c.
*Scrap Castings* per ton..... $6 00
" *wrought* " " ..... 8 00
*Pig Iron* per ton..... 7 00
*Iron ore* 20 per cent. *ad valorem*.
*Antimony*, crude or regulus, 10 per cent.
*Copper Ore*—On all fine contained therein, 3c. per lb.
*Old Copper*, fit for manufacture only, 4c. per lb.
*Copper*, pigs, bars, ingots or plates, 5c. per lb.
" sheets, bolts, nails, spikes, rods, pipes, &c., 45 per cent
*Tin*, in bars, blocks or pigs, and grain tin, free.
*Tin Plates*, or sheet, and terne or taggers tin, 1 1-10c. per lb.
*Lead*—Bars or pigs, 2c. per lb. Old lead, for manufacture only, 1½c. per lb. Pipes, shot and sheets, 2¼c. per lb.
*Zinc*, in blocks or pigs, 1½c. per lb.; in sheets, 2¼c. per lb.; manufactures of, 35 per cent.
*Quicksilver*, free.

## IRON MARKET REVIEW.

### New York.

FRIDAY EVENING, July 9, 1875.

**American Pig.**—The business doing continues to be very light. Some believe that an improvement will soon set in, but the majority of the trade do not see anything to warrant this belief. Foundrymen are complaining more now than at any time this year. They are working short-handed and short-time, and many have stopped entirely. The number of furnaces in blast is small, but we are informed that the production more than supplies the wants of consumers, and stocks are accumulating, although not rapidly. It is estimated that from 12,000 to 16,000 tons of pig iron have been shipped to California during the last eight months. This shipment has done much to sustain our market. Freights to San Francisco were as low as $9@$10 per ton, but have again advanced to $13, which, with an overstocked market, has closed that outlet. Scotch and English irons are being sold in that market now at figures that must necessarily exclude our irons. As we predicted a few weeks ago, the price of furnace coal at Mauch Chunk has been reduced, and it is now being sold at $2 75 per ton. This is about a dollar less than what was paid during the first five months of this year, and 50c. less than the lowest price of last year. An attempt was made to form a combination of the furnace companies for the purpose of standing against the coal companies until coal be furnished them at $2 per ton, but the movement failed. This figure is less than the furnace companies should expect, as under the existing circumstances the coal companies cannot make a profit on their coal if it be placed at less than $2 50 per ton at Mauch Chunk. With this decline in coal, furnace companies should be able to make money on the prices they claim to get for their iron, as the cost of making should not range above $20 to $22 per ton. We quote No. 1 Foundry at $26@$28; No. 2, $24@$26; and Forge at $22@$25 per ton. Several of the older companies are asking our higher figures, but we are informed that some No. 1 iron of prominent brand has been offered at a considerable concession. The Glendon Iron Company announced a semi-annual dividend of 5 per cent. on $1.000,000 capital, payable in Boston on and after July 1st.

**Scotch Pig.**—There is a very limited business doing with consumers, the transactions being confined to very small lots. 300 tons of Eglinton and Coltness have been sold from ship, on terms not named. The Glasgow market continues steady, and holders here are more firm. The stocks here are light, and there is but little to arrive; yet it is more than sufficient for the demand, and some lots have been placed in yard. We quote from ship, $31 50@$32 for Coltness; $29 50@$30 for Eglinton; $31 50@$32 for Glengarnock; and $30@$31 for Gartsherrie.

**Rails.**—We are unable to learn of any transactions having taken place since our last. Some inquiries continue in the market, which will probably result in business soon. We continue to quote American iron rails at $48@$50 at the mills, and steel at $70@$75. Judge DAVIS signed an order yesterday, which allows the sale of a part of the railroad iron of the JAY COOKE & Co. estate, for deposits made with COOKE, MCCULLOCH & Co. by the Navy Department since the failure of JAY COOKE & Co. We are informed that this decision will only place a few hundred tons on the market, and will not likely have any influence on the price of other English rails held in this market.

**Old Rails.**—We are unable to learn of any business having been done since our last. We continue to quote at $26 50 per ton.

**Scrap.**—There have been no further transactions. Many of the rolling mills are closed, and there is but little inquiry. We quote at $30@$32 from yard.

### Boston.

July 3, 1875.

The *Commercial Bulletin* says:—"Pig shows no improvement, nor any change for the week. A sale is an exception, while the inquiries are equally stagnant. Holders have kept remarkably quiet the past two weeks, and confess they see no encouragement to make quotations or any efforts to sell. Buyers are preparing to take account of stock, and at such a time are not at all interested in new purchases. The last sales of any interest have been from one to five-ton lots, as samples to several near-by foundry men, of No. 1 X. at $28 60 on board cars here. The sales are of iron from Western Massachusetts, and represented as A 1 in every respect. The market quotations are nominally on wharf here. No. 1, $29@$31; No. 2, $22@27, and Gray Forge, $21@24. New York advices quote $27@29 No. 1; $24@28 No. 2; and $22@26 Gray Forge. Foreign is without life.

"Bar has had a better week's trade, consequent upon the receipt of a large stock of small sizes, which have been almost wholly from Cleveland, Buffalo and Youngstown, the last-named place having forwarded 7 cars of small sizes direct to one dealer. The receipts this week and now billed on the way will not aggregate over 1,200 tons, the orders for which were placed about two months ago. Current rumor, however, attributes about 600 tons on consignment from mills. The market is quite steady at $58@60, the lowest price the cash basis. Common iron is listless and quotes nominally, $52@66. We notice at Boston and Albany 30 tons 3-16 rods of New England make billed through to a Cleveland mill, a very singular shipment.

"STEEL is quite dull, except for carriage makers' purposes, and in such qualities, more especially Tire Steel, a fair jobbing trade exists. We quote American Tool. 15c@15½c.; American Machinery, 9½c@10c.; do. cash Tires, 8½c@12½c.; Sweet's Excelsior Tire, 7c@7½c.; English Tool, 16c@17c.

"COPPER is very dull and firm. Speculators have lost all interest, and manufacturers are supplying their wants out of old metal. We quote 22¾c@23c. for spot; New Sheathing, 30c.; Bolts and Braziers, 31c.; Yellow Metal Bolts, 28c@29c.

"LEAD is quiet and steady. We quote Domestic, 6c.; Foreign, 6¼c. Antimony is in small demand at 12¼c@12½c. gold per lb.; Sheet and Pipe Lead, 9½c. currency; Tin-Lined Pipe, 16½c.; Bar Lead, 9⅝c., less usual trade or 10 per cent. discount.

"SPELTER is having a steady business with prices well maintained. We quote $7 25 currency 30 days, or $7 15 currency prompt cash. Silesian is quiet, quoting nominally $7 30 gold.

"TIN is easy, business being exceedingly slack. Plates are quiet. We quote Straits, 20c.; Banca, 24½c.; Refined English, 19¼c. gold. Plates are active; we quote Charcoal I. C., $9 50@10; Coke, $7 75@8; and Terne, $8 50@11 gold."

### Cincinnati.

July 6, 1875.

Specially reported by Messrs. TRABER & AUBERY, commission merchants for the sale of pig iron, blooms, ore, etc.

Our Pig Iron Market remains very dull and prices are nominal, We quote:

| | | |
|---|---|---|
| **CHARCOAL.** | | |
| Hanging Rock, No. 1 Foundry | $27 00@28 00 | 4 mos |
| " No 2, " | 25 00@26 00 | 4 mos |
| " Mill | 24 00@25 00 | 4 mos |
| Tennessee No. 1, Foundry | 26 00@27 00 | 4 mos |
| Tennessee, No. 2, " | 24 00@25 00 | 4 mos |
| " Mill | 24 00@25 00 | 4 mos |
| Missouri, No. 1, Foundry | @ | 4 mos |
| **STONE COAL.** | | |
| Ohio, No. 1, Foundry | 25 00@26 00 | 4 mos |
| " No. 2, " | 24 00@25 00 | 4 mos |
| Ohio Mill | 24 00@25 00 | 4 mos |
| Missiouri, No. 1 Foundry | 27 00@28 00 | 4 mos |
| " No. 2, " | 26 00@27 00 | 4 mos |
| " Mill | 26 00@27 00 | 4 mos |
| **CAR-WHEELS.** | | |
| Hanging Rock, C. B | 40 00@50 00 | 4 mos |
| Tennessee " | 35 00@40 00 | 4 mos |
| Missouri " | 35 00@40 00 | 4 mos |
| Alabama " | 35 00@40 00 | 4 mos |
| **BLOOMS.** | | |
| Charcoal | 70 00@ 80 00 | cash |
| **SCRAP IRON.** | | |
| Cast | 70c.@ 90 | cash |
| Wrought | 1 00@1 35 | cash |

### Chicago.

July 5, 1875.

Specially reported by Messrs. ROGERS & Co., dealers in Scotch and American pig iron. Quotations are as follows:

| | |
|---|---|
| No. 1 Coltness | $46 00@ .... |
| No. 1 Gartsherrie | 45 00@ .... |
| No. 1 Summerlee | 44 00@ .... |
| No. 1 Glengarnock | 42 00@ .... |
| No. 1 Eglinton | 40 00@ .... |
| Wareer's "American Scotch" | 38 00@ .... |
| Massilon No. 1 Foundry | 35 00@ .... |
| No. 1 Grand Tower Mo. ores (Bituminous) | 31 00@ .... |
| No. 2, " " " | 29 00@ .... |
| No. 1 Mill | 27 00@ .... |
| Union "A" 1 (Anthracite) | 28 00@ .... |
| Union "B" 1 (Anthracite) | 27 00@ .... |
| No. 1 Lake Superior (charcoal) | 32 00@ .... |
| No. 2 Lake Superior " | 30 00@ .... |
| No. 3 Lake Superior " | 33 00@ .... |
| No. 4 Lake Superior " | 35 00@ .... |
| Bessemer Steel Rails | 76 00@ .... |
| New Iron Rails | 52 00@ .... |
| Old Rails | 28 00@ .... |

### Cleveland, Ohio,

July 5, 1875.

Specially reported by Messrs. C. E. BINGHAM & Co., dealers in pig iron and iron ore:

| | |
|---|---|
| **FOUNDRY IRON.** | |
| No. 1, Lake Superior Charcoal | 32 50@.... |
| No. 2, " " | 31 50@.... |
| No. 1, Anthracite | 30 00@.... |
| No 2, " | 28 00@.... |
| No. 1, Bituminous foundry | 29 50@ .... |
| No. 2, " " | 27 50@.... |
| American Scotch, No. 1, Cherry Valley | 32 00@.... |
| " " B—1, " " | 28 00@.... |
| " " No. 2, " " | 27 00@.... |
| No. 1, Massilon | 31 00@.... |
| B—1, " | 29 00@.... |
| No. 2, " | 27 00@.... |
| **CAR WHEEL AND MALLEABLE IRON.** | |
| No. 3 Lake Superior Charcoal | 32 00@.... |
| No. 4 " " | 32 50@.... |
| Nos. 5 and 6 " " | 34 00@.... |
| **BESSEMER IRON.** | |
| Nos. 1 and 2 Lake Superior Charcoal | 32 00@.... |
| **FORGE IRON.** | |
| No. 1, Gray | 26 50@.... |
| White and Mottled | 24 00@.... |

*The Manufacturing and Trade Review* of July 6, says:

"PIG IRON.—The demand for pig metal is without change, being still confined principally to small lots, except in special cases where buyers are interested in the proprietorship of production. It is a remarkable fact that the rates still remain firm notwithstanding all the pressure of lower prices brought to bear against them in the east. A general resumption of the mills encourages holders to believe that they will be sustained in keeping the rates firm, more particularly as the quality has no competition and mill men themselves are desirous of sustaining the business to the highest point of good health.

"The bar iron market remains remarkably firm. Offers to purchase one hundred ton lots are every day made but holders are not inclined to make any deduction from present rates. The most urgent offers are from the East.

"The demand for boiler iron and galvanized sheet, wire and steel plate is increasing, and rates firm. Nails in good demand without change.

### Indianapolis, Ind.

July 5, 1875.

Specially reported by NELSON KINGMAN, broker and dealer in pig iron, etc.

Trade very dull at prices named below.

| | | |
|---|---|---|
| New Rails at mill | $56 00@58 00 | |
| Old Rails " | 28 00@30 00 | |
| Hanging Rock Charcoal Pig No. 1 foundry | 29 00@32 00 | —4 mos |
| " " " " " 2 " | 27 00@30 00 | —4 mos |
| " " " Mill | 25 00@28 00 | —4 mos |
| Car Wheel C. B | 45 00@50 00 | —4 mos |
| **STONE COAL.** | | |
| Indiana No. 1 Foundry pig Red Short | 30 00@33 00 | —4 mos |
| " 2 " " | 28 00@30 00 | —4 mos |
| " 1 Forge " " | ....@ .... | —4 mos |
| " 2 " " " | ...@ .... | —4 mos |
| Ohio No. 1 Foundry pig Cold Short | 28 00@30 00 | —4 mos |
| " 2 " | 26 00@29 00 | —4 mos |
| " Mill | 25 00@28 00 | —4 mos |
| " No. 1 Foundry, Neutral | 30 00@34 00 | —4 mos |
| " No. 2 " " | 28 00@30 00 | —4 mos |
| Merchant Bar | 2·35c. | —3 mos |
| 1st quality C. H. No. 1 Boiler Plates, per lb | 5½c. | —3 mos |
| 1st " Com. Sheet for No. 24, W.G. " | 4 c. | —3 mos |
| 1st " Charcoal Sheet " " " | 6 c. | —3 mos |
| Best Bloom Galvanized Shoet, discount 20 per cent | | —cash. |
| 2d quality " " " 30 " | | —cash. |

f. o. b. in Indianapolis.

### Louisville.

July 6, 1875.

Specially reported by Messrs. GEORGE H. HULL & Co.

The market for all grades of metal is dull, with a strong tendency to inside figures.

The usual time 4 mos. is allowed on the quotations below.

| | |
|---|---|
| **HOT BLAST—CHARCOAL.** | |
| No. 1 foundry, from Hanging Rock Ores | $27 00@28 00 |
| No. 2 " " " | 25 00@26 00 |
| No. 1, Mill, from " " | 23 00@24 00 |
| No. 1, foundry, from Alabama, Georgia and Tennessee ores | 25 00@26 00 |
| No. 2, foundry, from Ala., Geor'a and Tenn. ores | 24 00@25 00 |
| No. 1, Mill, from " " " " " | 23 00@24 00 |
| **HOT BLAST—STONE COAL AND COKE.** | |
| No. 1, foundry, from Hanging Rock ores | 25 00@26 00 |
| No. 2, " " " " | 24 00@25 00 |
| No. 1, Mill, " " " " | 23 00@24 00 |
| No. 1, foundry, from Ala. Ga. and Tenn. ores | 25 00@26 00 |
| No. 2, " " " " | 24 00@25 00 |
| No. 1, Mill, " " " " | 23 00@24 00 |
| No. 1 foundry, from Missouri ores | 27 00@28 00 |
| No. 2 foundry, from Missouri ores | 26 00@27 00 |
| Fo. 1 Mill, from Missouri ores | 26 00@27 00 |
| **COLD BLAST—CHARCOAL.** | |
| Car Wheel from Hanging Rock ores | 35 00@40 00 |
| " " Tennessee " | 30 00@33 00 |
| " " Alabama and Georgia ores | 30 00@35 00 |
| " " Kentucky ores | 28 00@35 00 |

**Milwaukee.** July 5, 1875.

The following are the present prices, per ton of 2,240 lb. :—

| | | |
|---|---|---|
| Frankfort L. S. Charcoal, | No. 1. | $30 00 |
| " " " | No. 2 & 3 | 28 00 |
| " " " | No. 4 & 5 | 31 00 |
| " " " | No. 6 | 35 00 |
| Mil. Anthracite L. S., | No. 1 | 30 00 |
| " " " | No. 2 | 28 00 |
| Wisconsin Iron, | No. 1 | 26 00 |
| Mahoning Valley Bit's | No. 1 | 32 00 |
| " " " | No. 2 | 30 00 |

**Pittsburgh.** July 5, 1875.

Specially reported by A. H. CHILDS, Esq., Commission Merchant for the sale of pig iron, blooms, ore, etc.

QUOTATIONS.

| | |
|---|---|
| No 1. foundry | $27 00@28 00—4 mos |
| " 2. " | 25 00@26 00—4 mos |
| Gray Forge | 24 00@25 00—4 mos |
| White and mottled | 22 00@23 00—4 mos |
| Hot blast charcoal | 28 00@30 00—4 mos |
| Cold blast charcoal | 35 00@40 00—4 mos |

The *American Manufacturer* of July 7th says:

PIG IRON.—Trade continues quiet, as it always is at this particular time, when it is customary with the mills to stop for stock-taking and repairs, and there is not likely to be any decided improvement for a week or so to come. The future of the market will depend largely upon the action of the mills; if they should desire, as is not unfrequently the case, to lay in a two or three months' supply, which would about exhaust the stocks in first hands, an advance would be almost certain; but if, on the other hand, they should continue to buy only for immediate wants, to adhere to the hand-to-mouth policy, an advance, to say the least, would be doubtful. During the past week trade has been very quiet, as it was very generally expected it would be, but the future of the market is a problem which a good many operators would like to have solved. The mills cannot, in view of the falling off in the demand for the products, as well as the unremunerative rates which have been current ever since they started up, see their way clear to pay additional advance for the raw article, which they allege is higher now than the product, while producers of the former claim that current rates scarcely cover actual cost, after taking the reduced price of ore, labor, etc., etc. into consideration. This is the situation present as well as prospective, at the present writing, and as will be observed, it is not very satisfactory to either maker or consumer—the great drawback in this as in every other branch of business, is a want of margin for profit, and this will require time to remedy; it is one of the legitimate effects of the late panic and one which time only will remedy.

MANUFACTURED IRON.—There is but little that is really new or important to record; business is reported falling off, orders are not coming in freely, and manufacturers very generally continue to report prices unsatisfactory. If so disposed, manufacturers could contract for future delivery at current rates, but this they are refusing to do, and it is evident, from the fact that both consumers and jobbers are willing to contract ahead, the feeling is gaining ground that the market has about touched bottom. So far as business is concerned, Pittsburgh has no reason to complain, all the mills (except Wharton's and the Superior rail mill, both bankrupt), have been running steadily ever since the ending of the lock-out, many of them double turn until within the past few weeks, when they were in consequence of the hot weather, obliged to change to single turn, and the production during the time in question was fully as large, if not larger than ever it was before. Our manufacturers have had the advantage of low freights by river all season until within the past few weeks, and this one fact enabled them to compete successfully with competing points, and we have no doubt, caused many orders to be placed that otherwise would have gone elsewhere. It is complained, however, that the railroads centering here are not disposed to be liberal towards the iron trade, notwithstanding they are dependent to a large degree upon the iron interest for business. The importance of improving the Ohio river here suggests itself, and it is a matter in which not only the iron trade but all branches of business in Pittsburgh are deeply interested. Prices are nominally unchanged; $2 25@2 30 Pittsburgh, and $2 35@2 40 eastern classification.

PIG METAL SALES REPORTED FOR THE AMERICAN MANUFACTURER FOR THE WEEK ENDING July 7, 1875.

BITUMINOUS COAL SMELTED FROM LAKE SUPERIOR ORE.

| | |
|---|---|
| 50 tons foundry | $25 00—4 mos. |
| 300 tons gray forge | 24 00—4 mos. |
| 100 tons gray forge close | 23 00—4 mos. |
| 200 tons gray forge, low grade neutral | 23 00—4 mos. |

ANTHRACITE.

| | |
|---|---|
| 20 tons No. 1 foundry | $28 00—4 mos. |

COKE.

| | |
|---|---|
| 700 tons gray forge, Connellsville | $24 00—4 mos. |

**San Francisco.**

From the *Commercial Herald* of June 24, 1875.

"The ship *City of York* is at hand from Liverpool with 400 tons of Pig Iron and 256 ingots Tin. The ship *Carrier Dove* for New York carried 794,620 lb. 'Selby' Pig Lead. With us stocks of most descriptions of raw and manufactured iron, etc., are liberal, and prices favor the buyer. The price of Australian Block Tin has declined to 22½c. Scotch Pig Iron is for spot parcels nominal at $38@40: same to arrive, $34@35. Charcoal Tin Plate, $11 50 per box."

## METALS.

NEW YORK, Friday Evening, July 9, 1875.

**Gold Coin.**—During the week past gold has ranged from 115⅝ to 117¼, and closed to-day at 116¼.

**Bullion.**—Fine silver bar is quoted at $1 21@1 22¼ gold, per ounce, and fine gold bar, par ($20 67 gold per ounce) to ¼ per cent. premium.

**Copper.**—The sales during the week will probably aggregate 150,000 lb.; 50,000 lb. were sold at 22⅝c.; 50,000 lb. at 22¼c.; and other small lots at prices ranging up to 23c. The asking price to-day for Lake is 23c., with 22⅝c.@22¾c. bid, 22½c. is asked for Baltimore. There is very little demand, and but little offering. Most of the manufacturing companies have shut down for repairs, as is customary at this time of the year. Manufacturers are reported to have but light stocks of both manufactured goods and ingot copper; yet they continue to follow a hand-to-mouth policy, apparently awaiting an undoubted revival in trade. They have been expected in the market for larger quantities for several months, but having disappointed the dealears so long, it is impossible to say when they will make their appearance. Chili Bars are quoted at £81@£81 10/ in London.

MESSRS. JAMES & SHAKESPEARE, of London, under date of June 25, say:—

"Since we last wrote, fresh disasters have occurred in the commercial world, but the failures have been nearly all restricted to a particular circle, and though great caution is exercised in every quarter, there seems no special reason to believe that the unsoundness, lately disclosed, is likely to be discovered in other channels. Bullion continues to flow into the Bank, and further large sums will, in all probability, be sent in during next week; it is therefore anticipated that the rate must shortly be reduced, and that we shall see a very easy money market during the remainder of the year.

"No transactions have been received in furnace material, and importers are asking the highest figures on our list, without being free sellers thereat.

"The only metal which appears to have been held on account of the firms which suspended payments, was a parcel of 200 tons good ordinary brands Bars, and these found buyers at £81 10/ per ton, usual cash terms; beyond this lot, nothing of a like nature was offered, and even at £82 the quantity on sale was extremely limited, the purchases at the last figure scarcely exceeding 100 tons. Importers and dealers have totally refrained from pressing sales, and, though our quotations are about the same as we gave on 18th inst., it is rather doubtful if so much stuff could now be secured at the top rates as was then to be had at such prices."

**Tin.**—There is a good jobbing demand for tin plates which are quoted at $8 12½c.@$8 37½c. for I.C. charcoal; $7 25@$7 50 for ternes; $6 75@$7 for coke tins; and $6 50@$7 for ternes, prices all gold. The demand for pig tin is very quiet, Straits, Refined and Common being quoted at 18¾c @19c., and Banca 23c. gold. Straits are quoted in London at £81 per ton, and in Singapore at $22⅞ per picul.

ERNEST W. S. MURRANT, Esq., of London, under date of June 25, says:—

"Straits has been but little dealt in during the week, and shares in the depression observable in other metals, a fall of about £1 is the result; it is hoped, however, that this may be retrieved when the deliveries for the current month become known, and that, before the end of the year, the total of deliveries may exceed that of the imports. The sales have been 50 tons Straits, and 60 tons Australian at 81/ to 84/ for cash."

**Lead.**—The transactions of the week under review have not exceeded 75 tons at about 6c. gold. Manufacturers are well supplied, and but little business is looked for during July and August. Foreign is quiet at 6⅞c. gold.

**Spelter and Zinc.**—The Combination have advanced the price of Domestic Spelter to 7.35c., cash, and 7 45c., 30 days. These prices are considered too high to stimulate business, and it is rumored that some members of the Combination are dissatisfied with them. The only business we learn of was from an outside lot, being several car loads at 7c. currency.

**Antimony** is quiet at 13c.@13½c. gold.

**Quicksilver.**—This market has declined to 75c. and San Francisco to 70c. per lb. Our latest London advices note a decline to £10 15/@£11 per flask.

The San Francisco *Commercial Herald* says:—The supply is good, yet the current demand is equal thereto. The steamer *City of Melbourne* carried to the Colonies 90 flasks—price 65c.

## FINANCIAL.

**New York Stocks.**

July 9, 1875.

The occurrence of our National Holiday has greatly restricted the week's operations of the New York Stock Board. Our record of transactions represents four full days' business.

The general tendency of the market is upward, closing steady yesterday, at an advance.

Maripoza has been fairly active during the week, with quotations at the close slightly in advance of those reported in our last. The Tunnel, on the 28th of June, was in 883 feet; 47 feet advance having been made the previous week. The heading, according to reports, was in massive serpentine carrying rich sulphurets, and water had been struck.

The coupon bonds of the Cannelton Coal Company of West Virginia, due July 1st, will be paid, on and after that date, at the office of the Farmers' Loan and Trust Company in this city.

At auction on the 7th inst., the following were sold at the prices annexed: $10,000 Delaware and Hudson Canal 7 per cent. Reg. bonds, 107¼; $20,000 American Dock Improvement Co. 7 per cent. Coup. bonds, 99 to 99½.

The Baltimore and Ohio Railroad Company's stock was quoted at the close of the Baltimore Stock Board yesterday, at 175 bid.

The Glendon Iron Company, with a capital of $1,000,000, has declared a dividend of 5 per cent. on the same, payable in Boston on July 1st.

QUOTATIONS AND SALES OF STOCKS:

| | Highest | Lowest | Closing | Sales |
|---|---|---|---|---|
| Pennsylvania Coal Co. | — | — | — | — |
| Consolidation Coal Co. | — | — | 45 | 200 |
| Spring Mt. Coal Co. | — | — | 64¼ | — |
| American Coal Co. | — | — | *56 | — |
| Maryland Coal Co. | — | — | 19 | — |
| Cumberland Coal and Iron Co. | — | — | — | — |
| Del., Lack., and West. RR. Co. | 120 | 118¾ | 120 | 1375 |
| New Jersey Central RR. Co. | 112 | 110 | 112 | 277 |
| Delaware and Hudson Canal Co. | 122 | 121¾ | 122 | 383 |
| Quicksilver Mining Co. pref'd | — | — | 22 | 100 |
| " " " Common | — | — | — | — |
| Mariposa Land & Min. Co. various. | 13¼ | 11 | 13¼ | 14000 |
| St. Louis & Iron Mountain RR. | — | — | 19 | — |
| Lehigh & Wilkes-Barre Coal Co. | — | — | — | — |
| Total Sales | | | | 16335 |
| Sales for the week previous | | | | 48256 |
| Decrease | | | | 21921 |

The following are the sales of bonds for the same period:

| | Amount | | Price |
|---|---|---|---|
| Del. Lack. & W. RR. convertible, | | ....at from | .. @.... |
| N.J. Central RR. 1st consolidated mortgage bonds | 7,000 | " | 105½ "..... |
| St. Louis & Iron Mount'n 1st Mtg bonds. | 3,000 | " | 91 "..... |
| St. Louis & Iron Mountain, 2d Mtg. bonds | .... | " | .... "..... |
| N. J. Central Con. Convt. | .... | " | .... "..... |
| " " 1st Mtg. N. | .... | " | .... "..... |
| Del. & Hudson Canal, 1st Mtg. Reg. bonds, 1891 | .... | " | .... "..... |
| Del. & Hudson Canal, 7s, 1894, | 12,000 | " | 107 " 107½ |
| Del. Lack. & W. R. R., 2d Mtg. | .... | " | .. "..... |
| C. & O. R. R. 1st Mtg. Coupon on | 500 | " | 36 "..... |
| " " " ex coupon | 500 | " | 30 "..... |
| Total Sales | $23,000 | | |

* Asked.

**Philadelphia Stocks.**

PHILADELPHIA, July 9, 1875.

The dealings at the Philadelphia Stock Board have been very limited during the week, the market remaining steady, with scarcely any variation in prices, closing within a fraction of quotations reported in our last.

The following were sold at auction on the 6th inst.: 60,000 Columbia Steel & Iron Co. 2d Mtge. 7 per cent. coupons at 5 per cent.; $2,000 L. V. R. R. Reg. 6s of '98 at 102.

The Minehill & Schuylkill Haven Railroad Company announces a dividend of $1 75 per share, payable on demand.

The Little Schuylkill Navigation Railroad Company announces a dividend of 3½ per cent., payable on demand.

QUOTATIONS AND SALES OF STOCKS:

| | Highest | Lowest | Closing | Sales |
|---|---|---|---|---|
| Reading RR. Co | 56 | 54¾ | *54¾ | 4742 |
| Lehigh Valley RR. Co. | 61¼ | 60⅞ | 61¼ | 405 |
| Little Schuylkill RR | — | — | 50 | — |
| Catawissa RR. | 20¼ | 20 | 20¼ | 202 |
| " " Preferred | 42⅜ | 42½ | 42⅜ | 187 |
| " " New Preferred | — | — | 38¼ | — |
| Huntingdon and B. T. RR. | — | — | 7 | — |
| " " " Pref'd | — | — | 14½ | — |
| Minehill RR. | — | — | 52½ | 16 |
| Lehigh Coal and Nav. Canal. | 50¼ | 50 | 50¼ | 5053 |
| Morris Canal | — | — | 50 | — |
| " Preferred | — | — | 128 | — |
| Pennsylvania Canal | — | — | — | — |
| Schuylkill Navigation Canal | — | — | 14⅝ | 60 |
| " Preferred | — | — | — | — |
| Delaware Division Canal | — | — | — | — |
| Susquehanna Canal | — | — | — | — |
| Westmoreland Coal Co. | — | — | 7 | — |
| Buck Mountain Coal Co. | — | — | — | — |
| Fulton Coal Co. | — | — | 30 | — |
| Cambria Iron Co. | — | — | — | — |
| Locust Mountain Coal Co. | — | — | — | — |
| Emaus Iron Co | — | — | — | — |
| Crane Iron Co. | — | — | — | — |
| Total sales | | | | 10,665 |
| Sales for the week previous | | | | 21,451 |
| Decrease | | | | 786 |

* Ex. Dividend.

Sales of the various bonds for the period under review have been as follows:

| | Amount. | | Price |
|---|---|---|---|
| Reading RR. 6s, 44,80. | — | ..... | — @ — |
| Catawissa, RR., new 7s. | — | ..... | — @ — |
| H and B. T. RR. 2d mortgage, 7s. | — | ..... | — @ — |
| Lehigh convt. gold loan | — | ..... | — @ — |
| Pa. and N. Y. Canal, 7s. | 1,000 | ..... | 106½@ — |
| Schuyl. Nav. 6s, '95 ex coup. | 3,000 | ..... | 78⅜@ — |
| L. V. RR. con. mtge. 6s reg. | 5,000 | ..... | 98⅜@ 99 |
| H. and B. T 1st Con. 7s. bonds. | — | ..... | — @ — |
| R. C. and I. Co. irregular mort. bonds, Brady Tract | — | ..... | — @ — |
| Lehigh Nav. 6s. 1884. | 4,000 | ..... | 102 @ — |
| Reading RR. debenture bonds. | 1,000 | ..... | 79 @ — |
| " " G. M. 7s, reg. | 6,000 | ..... | 107 @107¾ |
| " " new convertible 7s. | 4,500 | ..... | 105 @ — |
| " " 7s, 93. | — | ..... | — @ — |
| Reading C. & I. Co. debent. bonds. | 9,000 | ..... | 82⅛@ — |
| Reading C. and I. Co. mort. bonds, Tamaqua Tract | — | ..... | — @ — |
| Reading C. and I. Co. mort. bonds, St. Clair Tract. | — | ..... | — @ — |

| | | | |
|---|---|---|---|
| R. C. and I. Co., Wetherill tract.. | — | ..... | — @— |
| " " " " " Locust Mountain | | | |
| Summit Improvement tract. | — | ..... | — @— |
| R. C. and I. Co., Helfenstein tract. | — | ..... | — @— |
| Lehigh C. & N. Co. 6s..... | — | ..... | — @— |
| " " " 7s..... | 1,000 | ..... | 109¾@— |
| Lehigh Coal and Nav. Co. 6s, gold loan .... ..... ..... | 9,500 | ..... | 101¾@102¼ |
| Lehigh Coal and Nav. Co. con. l'n. | 1,000 | ..... | 99 @— |
| " " " " " RR. loan | — | ..... | — @— |
| Schuylkill Nav. 6s. '97..... | — | ..... | — @— |
| " " 6 per cent boat loan | — | ..... | — @— |
| Schuylkill Nav. 6s. '62 ..... | 4,100 | ..... | 80¼@— |
| " " 7 p.c. boat loan .... | 2,000 | ..... | 78 @— |
| R. C. & I. Co , Glentworth tract... | — | ..... | — @— |
| Chesapeake & Delaware Canal, 6s.. | — | ..... | — @— |
| Susquehanna Canal, 6s..... | — | ..... | — @— |
| Pennsylvania Canal 6s..... | — | ..... | — @— |
| Shamokin Valley Pottsville RR..7s. | — | ..... | — @— |
| Del. Div. Canal, 6s ..... ..... | — | ..... | — @— |
| Morris Canal, 1st mtge. 6s..... | — | ..... | — @— |
| Total sales..... | 51,100 | | |

**Gold and Silver Stocks.**

SAN FRANCISCO, July 7th, 1875.

Belcher exhibits a decline of $1 per share, as compared with our last quotations. Eureka Consolidated is also down $2 per share. These are the only exceptions to a general recovery of the whole list, on an average of possibly $2 per share, the market closing firm at the following prices :

Quotations July 7, 1875.

| | | | |
|---|---|---|---|
| Gould & Curry..... | 16 | Overman..... | 56 |
| Savage ..... | 50 | Raymond & Ely.. ..... | 50 |
| Chollar Potosi..... .. | 72 | Eureka G. V.... ..... | 5 |
| Ophir..... | 46 | Best & Belcher..... | 46 |
| Hale and Norcross..... | 36 | Kentuck..... | 13 |
| Crown Point ..... | 26 | Meadow Valley..... | 7 |
| Yellow Jacket..... | 75 | Alpha..... | 16 |
| Eureka Consolidated... | 62 | Sierra Nevada..... | 13 |
| Belcher..... | 24 | Union Consolidated.... | 6 |
| Imperial. ..... ..... | 7 | Mexican..... | 18 |
| Consolidated Virginia.... | 325 | Caledonia..... | 17 |
| California ..... .... | 57 | Silver Hill..... | — |

The Savage Mining Co.'s main shaft is sinking to the 2300-foot level. The Crown Point Mining Co. is at present producing 550 tons, the Belcher 500 tons, the Consolidated Virginia 600 tons, and the Ophir Mining Co. 150 tons of ore daily.

The mining dividends paid by San Francisco gold and silver mining companies during the first half of the present year, have been as follows :

| | |
|---|---|
| Consolidated Virginia Mining Co..... | $4,968,000 |
| Belcher Silver Mining Co..... .... . | 312,000 |
| Redington Quicksilver Co ... ... ..... | 226 000 |
| Crown Point Silver Mining Co ..... ... | 200,000 |
| Eureka Consolidated Silver Mining Co. .... | 280,000 |
| Black Diamond Mining Co ..... ..... | 100,000 |
| Black Bear Quartz Mining Co ..... | 81,000 |
| Great Western Quicksilver Co... . ..... .. | 50,000 |
| Jefferson Silver Mining Co..... ..... .. | 50,000 |
| Manhattan Silver Mining Co. ..... ..... | 50,000 |
| Northern Belle Silver Mill and Mining Co ... | 50,000 |
| Lyon Mill and Mining Co..... ..... | 30,000 |
| Leopard Silver Mining Co . ..... .... .... | 25,000 |
| Rye Patch Consolidated Mining Co. ..... | 22 500 |
| Empire Gold Mining Co..... . | 20,000 |
| Oneida Gold Mining Co . .... ..... | 15,000 |
| Excelsior Mill and Mining Co ..... .. ..... | 12,000 |
| Empire Mining Co..... ..... .. ..... | 5,000 |
| Genessee Valley Mining Co..... | 5,000 |
| Total..... . ..... | $6,421,500 |

The Manhattan was formerly owned in New York, but was then unproductive. Its shipments for the first twenty days in June amounted to $103,573. The stock in the Oneida Company is largely held in New York.

The total length of the Sutro Tunnel at last advices was 9855 feet, when the heading was in hard greenstone. The estimated distance to the Comstock Lode from that point is 10,145 feet.

**Copper Stocks.**

BOSTON, July 8, 1875.

Copper stocks are firm at our quotations. Allouez & Central have materially advanced on last prices. The Calumet & Hecla Mine is said to be in excellent condition, and at present producing largely a very fine class of ore.

The Winthrop Mining Co.'s stock has been very active during the week, closing with sales to-day at 65c. per share ; recent sales of Franklin have occurred at $13 per share ; and also of the National Mining Co. at $2 75 per share. We note a recent transaction of the Silver Islet Mining Co. at $30 per share.

Quotations are as follows :

| | | | |
|---|---|---|---|
| Allouez..... | 16½ | National..... | .. |
| Calumet and Hecla Co.. | 159 | Petherick..... | .. |
| Copper Falls..... | 8 | Quincy... ..... ..... | 43¾ |
| Central. ..... ..... | 34¾ | Ridge..... | 6¾ |
| Franklin ..... | .. | Rockland.... ..... | 1½ |

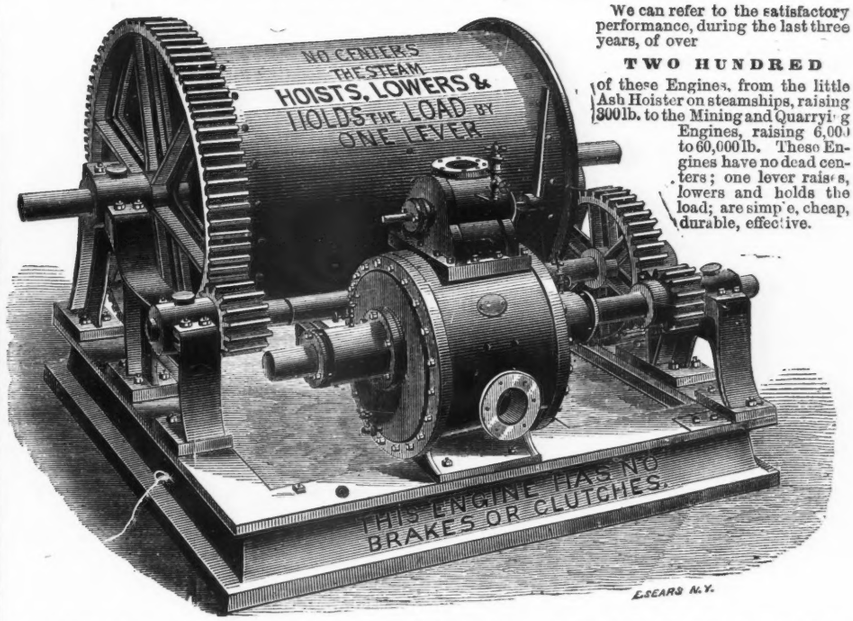
**Gas Stocks.**

NEW YORK, July 9, 1875.

The following quotations of Gas Stocks represent prices bid, or at which actual sales have been made during the week :

| | | | |
|---|---|---|---|
| Manhattan Gas Light Co. | New York..... | | 293¼ |
| Metropolitan " | " | " ..... | 155 |
| New York " | " | " ..... | 157½ |
| Mutual " | " | " ..... | 100 |
| Harlem " | " | " ..... | 130½ |
| Baltimore " | " | Baltimore, Md..... | 190 |
| People's " | " | " ..... | 25½ |
| Boston, Mass. " | " | ..... | 765 |
| Cambridge, " | " | ..... | 132¾ |
| Portland, Me. " | " | ..... | 72 |
| Hartford, Conn " | " | ..... | 44½ |
| San Francisco, Cal. " | " | ..... | 101 |
| Williamsburgh " | " | ..... | 137½ |


## ROTARY REVERSIBLE HOISTING ENGINES.




We can refer to the satisfactory performance, during the last three years, of over

**TWO HUNDRED**

of these Engines, from the little Ash Hoister on steamships, raising 300 lb. to the Mining and Quarrying Engines, raising 6,000 to 60,000 lb. These Engines have no dead centers ; one lever raises, lowers and holds the load; are simple, cheap, durable, effective.

We ask those looking for Hoisting Engines, and Mining Machinery, to consult either of the following references : Eckley B. Coxe, Proprietor of Cross Creek Collieries, and Vice-Prest. of the Am. Inst., of Mining Engineers, Jeddo, Luzerne Co,, Pa. ; J. H. Lyon, Prest. Straitsville Coal Mines, Office 115 Broadway, New York ; Geo. E. Hall, Prest. Central Vermont Marble Co. ; Post Office, Cleveland, Ohio ; Ingersoll Rock Drill Co., No. 5 Park Place, New York ; Gilbert Fowler, Chief Engineer Pacific Mail Steamship Co., Pier 42 North River, N. Y. ; S. F. Shortland & Bro., Steam Lighters, 106 Wall st., New York; Divine Burtis Jr. ; Contractor, Brooklyn, N. Y. ; Wm. A. Lighthall, Consulting Engineer, Office 5 Bowling Green, N. Y, ; Erastus W. Smith, Consulting Engineer, Office 42 Dominick st., New York. Every Engine fully warranted. Made only by

SEND FOR CIRCULAR.

**LIDGERWOOD MANUFACTURING CO.,**
**165 Pearl Street, New York.**


A dividend of 5 per cent has been declared by the East Boston Gas Light Company, payable July 15th. The capital stock of this company amounts to $220,000.

The Chelsea, Mass., Gas Light Company has its dividend period during the month; the amount has not been declared as yet. The Brookline, Mass., Gas Light Company also has its dividend period during this month. The capital stock of this company amounts to $250 000, on which it paid a dividend of 4 per cent. in Jan. last.

The Newton and Watertown, Mass., Gas Light Company, with a capital stock of $200,000, has not declared its usual dividend as yet, the dividend for last January amounted to 4 per cent. on its capital stock.

At an auction sale here, on the 7th inst , 25 shares of the Manhattan Gas Light Company's stock sold at 293¼, and 44 shares New York Gas Light Company at 157½.

## American Institute of Mining Engineers.

OFFICIAL BULLETIN.

**Announcements to Members and Associates.**

I. THE ENGINEERING AND MINING JOURNAL, containing the official reports of proceedings, transactions and notices of meetings, will be sent to each Member and Associate on the payment of his annual dues. Back numbers cannot, as a rule, be sent.

II. Dues (ten dollars per annum) are payable on election and at the annual (May) meeting. Members and associates elected at the February meeting pay ten dollars only to May of the following year. Remittances should be made, as far as possible, by P. O. Order, payable to the Secretary.

III. Blank proposals for membership can be had on application to the Secretary.

IV. The second volume of Transactions has been mailed to all home members and associates not in arrears. Any member who failed to receive his copy will please notify the Secretary promptly. The Institute is not responsible for the loss of the volume in those cases where members have changed their residences and have omitted to inform the Secretary. Volumes I. and II. will be sent, post-paid, to non-members, at five dollars each.

THOMAS M. DROWN, Secretary, Lafayette College Easton, Pa.


## TO INVENTORS AND MANUFACTURERS

The 44th Exhibition of the American Institute will open September 9th ; Machinery will be received after August 15th, other goods after August 29th. For particulars address "General Superintendent, American Institute, New-York."

## MANUAL OF SCHOOL MATERIAL

**Has over 400 Illustrations.**

And describes 4000 Articles for School Use. It represents Apparatus, Black Boards, Books, Charts, Globes, Kindergarten Apparatus, Maps, Gymnastic Apparatus, Object-Teaching Apparatus, School-Books—the best in America ;

**MODERN SCHOOL FURNITURE**

of all Styles—Desks from $2.50 Upwards,

And "Everything for School."

It is Mailed for 25 Cents.

J. W. Schermerhorn & Co., *Publishers and Manufacturers*,
14 BOND ST., NEW YORK.

## OSBORN M'F'G. CO.

79 TRADE MARK 79

BLEECKER ST. NEW YORK.

**OSBORN'S BRIGHT METAL CAGES.**

The original Inventors and Manufacturers of the

## Osborn Bright Metal Cages.

Also OSBORN & DRAYTON improvements under twelve different patents. We are continually bringing out new and beautiful designs to meet the demands of refinement and taste.

ALVAN DRAYTON, GENERAL AGENT.

## HALLIDIE'S
## ENDLESS WIRE ROPEWAY,

[WIRE TRAMWAY,]

FOR THE

**Rapid and Economical Transportation of**

**ORES, STONE, COAL, Etc., Etc,**

OVER MOUNTAINOUS ROADS.

Covered by numerous United States Patents.

☞Has been in use over three years on Pacific coast, and is the most effective system ever matured.

Read the following:

Office of the CHICAGO SILVER MINING CO.,
SALT LAKE CITY, Dec. 1, 1874.

A. S. HALLIDIE.—DEAR SIR: I have pleasure in stating that your Ropeway, put up at the Chicago Mine, Ophir District, Utah Territory, one year ago last summer, has been in constant use ever since, and with the most satisfactory results.

The line, as you are aware, is constructed over an extremely rugged country, one and one quarter miles in length.

For the first half mile or so, it is down a very steep mountain side, whence it passes over the brow of another one; thence it continues down Dry Canon at an angle of fifteen to eighteen degrees.

The structure is an entire success, the cost entire of which has more than been saved already, although it has not been worked up to half its capacity.

In the estimate of earnings no account was taken of supplies sent to the mine, including water, etc., by no means an inconsiderable item. Truly yours, W. S. GODBE,
Manager Chicago S. M. Co. (limited.)

Supt. Office EMMA HILL CONSOLIDATED M. Co.,
LITTLE COTTONWOOD, Utah, Dec. 17, 1874.

A. S. HALLIDIE, Esq.: Dear Sir—In answer to your inquiry, I have to report that the Ropeway (built August, 1872), continues to work splendidly, and with but little wear on the rope. It has been everything that was promised, and has proved to be the cheapest way to move ores on steep mountain sides.
Yours very truly, L. U. COLBATH, Sup't.

Send for Circular to

**A. S. HALLIDIE,**

No. 113 PINE STREET, San Francisco, Cal.

---

## VULCANIZED RUBBER

NEW YORK

## BELTING & PACKING CO.,

The oldest and largest manufacturers in the United States of

## Vulcanized Rubber Fabrics,

ADAPTED TO

**MECHANICAL PURPOSES,**

invite the attention of all who are interested in the sale or use of such articles to the high standard quality and low prices of their various manufactures, comprising

MACHINE BELTING, STEAM PACKING, LEADING HOSE, SUCTION HOSE, CAR SPRINGS, WAGON SPRINGS, BILLIARD CUSHIONS, GRAIN DRILL TUBES, ETC., ETC.

**"TEST" HOSE,**

made expressly for the use of Steam Fire-Engines, and will stand a pressure of 400 pounds per square inch. Officers of Fire Departments requiring New Hose will find this much superior in strength and quality to any other.

PATENT

**Solid Emery Vulcanite Wheels,**

A composition of rubber and emery, making a very hard uniform substance of the nature of stone throughout. These Wheels for grinding and polishing metals, "gumming" saws, etc., are the most economical and effective tools that can be used.

WAREHOUSE:

**737 and 38 Park Row, New York.**

JOHN H. CHEEVER, Treasurer.

Price-lists and further information may be obtained by mail or otherwise, on application.

---

## E. B. BENJAMIN,

**10 BARCLAY STREET,**

NEW YORK CITY.

Importer and manufacturer of all kinds of apparatus for mineral and chemical analysis. *Laboratory and assaying Tools, Prospecting and Mining Implements, accurate* Balances and Weights, Furnaces, Tongs, Freiberg Scorifiers, French Cupels and Assay Cups. Flasks, Dippers, *Crucibles*, etc. Complete *Blowpipe* sets for gold and silver tests, Compasses, Becker's Ingot Moulds, Lenses, Evaporators, etc., etc.

For better description of apparatus and prices, see the large *Illustrated Catalogue*, beautifully gotten up, in cloth.

**Price - - - $1 50 per Copy.**

---

## TRI-NITRO-GLYCERIN,

THE MOST POWERFUL EXPLOSIVE KNOWN.

## Mica Blasting Powder,

The New Explosive, whose safety, power and economy may be estimated from the subjoined letter.

HOOSAC TUNNEL CONTRACT.
NORTH ADAMS, MASS., Aug. 20, 1874.

DEAR SIR:

Within the last six months we have used some 30,000 lbs. of your "Mica Powder," and with the exception of the "Tri-Nitro-Glycerin" itself have had no better explosive in our works here. It is light to carry, safe (as far as that term can be applied to any explosive) to handle, "nimble" to explode and thorough in combustion—a very essential quality in all preparations of Nitro-Glycerin.

Where pure Nitro-Glycerin is not wanted we do not ask any better substitute than Mica Powder.

Yours Truly, W. SHANLY.

GEO. M. MOWBRAY, Esq., North Adams.

Mowbray's "Powder Keg" Battery; for simultaneously firing a series of mines or drilled holes.

Gutta Percha insulated leading wire for electric blasting
Electric Fuses for submarine blasting.
Electric Fuses for rock blasting.
Gutta Percha and Cotton covered Electric Wire.
Tape Fuse Exploders for Contractors' use, etc., etc., etc.

All the above materials are manufactured by the undersigned, guaranteed to perform as represented, being the result of seven years' experience at the Hoosac Tunnel, and in various submarine works throughout the States.

**GEO. M. MOWBRAY,**

Hoosac Tunnel Tri-Nitro-Glycerin and Gutta Percha Works,
NORTH ADAMS, MASS.

**A. W. DESPARD**, Agent, 22 Cedar street, New York.

---

## BLASTING POWDER.

**LAFLIN & RAND**

## POWDER COMPANY,

21 PARK ROW, NEW YORK.

P. O. BOX, 2308.

Mills in several different States of the Union.

Manufacturers of the best Blasting Powder, and also of the celebrated

**ORANGE SPORTING POWDER,**

Known for many years as the best brands of the country.

**ELECTRICAL BLASTING APPARATUS.**

---

**GEORGE FOCHT,**

## Iron Foundry, Machine and Sheet Iron Works,

First and Adams Sts.,

**HOBOKEN, N. J.**

Inventor, Patentee, and Manufacturer of the **Celebrated Self-dumping Hoisting Tubs.** Hoisting Blocks, Self-dumping Cars of different kinds, and Iron-box Wheelbarrows of all sizes. Iron-work for different kinds of hoisting apparatus made to order and put up when desired. Particular attention paid to repair work in this line. All work delivered to any Depot in New-York City or vicinity.

---

## HARTFORD
## STEAM BOILER
## Inspection & Insurance
## COMPANY.

W. B. FRANKLIN, V. Pres't. J. M. ALLEN, Pres't.
J. B. PIERCE, Sec'y.

---

**Ot's' Passenger and Freight**

## ELEVATORS

For Hotels, Stores, Factories, etc. A SPECIAL HOIST for Blast Furnaces.

**Address OTIS BROTHERS & CO.,**
348 Broadway, New York.

---

## BALTIMORE COPPER WORKS.

*(Canton.)*

**POPE, COLE & CO.**

ARE NOW PURCHASING

## COPPER ORES,

and smelting and refining at these extensive works, where, with experienced workmen and extraordinary facilities, we are turning out Ingot and Cake Copper of unequalled purity and toughness.

We are prepared to buy *Ores*, Matte, Regulus and other furnace material, in any quantities.

At *Salt Lake City*, Mr. Geo. J. Johnson, our representive, will receive, sample, assay and pay each for ores of that vicinity.

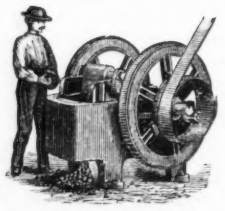
In *San Francisco* we are likewise represented by Mr. Horace D. Ranlett, 218 California street.

Office, No, 57 South Gay street, *Baltimore, Md.*

---

**Blake's Patent Stone and Ore Breaker**

NEW PATTERN.



WITH IMPORTANT Improvements.

Used for reducing to fragments of any required size all hard and brittle substances, such as Stone for Macadam Roads, and for making Concrete, and for Ballasting Railroads: also for crushing IRON, COPPER, ZINC, SILVER, GOLD, and other Ores. Also for crushing Quartz, Flint, Emery, Corundum, Feldspar, Barytes, Manganese, Graphite, Phosphates, Plaster, Soapstone, Coal, Old Fire Brick, Mineral Paints.

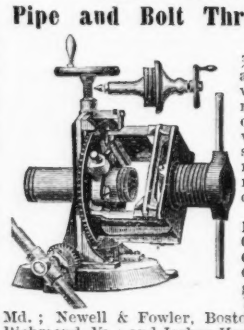
*Also*, small hand machines for *Laboratory testing* and *assaying* samples of ore.

**BLAKE CRUSHER CO., New Haven, Ct.**

---

**IMPROVED PORTABLE**

**Pipe and Bolt Threader and Cutter.**



Cuts off and threads from ¾in. to 3in. pipe and bars, also TAPS, NUTS and CENTERS, work ready for Lathe. One man can thread 3in. Pipe with ease with the Dies furnished with the machine. No work spoiled by splitting. Requires no skilled labor. A boy can run it. All parts interchangeable.

For Sale by Redfield, Bowen & Walworth Co., Chicago, Ill.; McHenry & Co., Cincinnati, Ohio; Bull & Co., Indianapolis, Ind.; Lovegrove & Co., Philadelphia, Pa.; Reuter & Mallory, Baltimore, Md.; Newell & Fowler, Boston, Mass.; Rahm & Hunter, Richmond, Va.; and Joshua Hendy, San Francisco, Cal.

Send for Circular. Address,

**Empire Manufacturing Company,**
No. 48 GOLD ST., NEW YORK.

---

## BLACK DIAMOND STEEL.

TRADE MARK. TRADE MARK.

**Park, Brother & Co.**

**NEW YORK, PITTSBURGH, BOSTON, CINCINNATI.**

**FINE TOOL AND DRILL STEEL A SPECIALTY**

---

**HELLER & BRIGHTLY, Engineering and Surveying Instruments, 33 N. Seventh St., Philadelphia.**

TRADE MARK.

REG. JUNE 27TH 1871.

Without decreasing size of any part of our "Engineers' Transit" we have reduced the weight one-half. An ordinary Transit Telescope magnifies from 10 to 12 diameters, our new Transit Telescope (length 10½ inches, shows objects erect and not inverted) magnifies 28 diameters and will read time on a watch-dial at 983 feet. For description of our new Mining Transit (weight 5½ lbs.) and Plummet Lamp, see Van Nostrand's Engineering Magazine, June, 1873.

Extract from report of Committee of Civ. Engs. appointed by Franklin Inst. to examine H. & B.'s new Transit (Dec. 1871): "It exhibits several novelties of construction which, in the opinion of the committee, render it superior to those now in use, and in its opinion the deviations which they have made from the common styles of Transit are decided improvements."
JOHN C. TRAUT WINE, Chairman.

Descriptive and Illustrated Price List sent Post-paid, on Application.

**RICHARD P. ROTHWELL**
**Mining Engineer.**
**Office of the Engineering and Mining Journal,**
27 PARK PLACE, NEW YORK.
Surveys, Examines and Reports on *Coal* and *Iron* Properties and Mines.
Advises on all questions of the Working and Management of Mines.

THOMAS M. DROWN,
**ANALYTICAL CHEMIST,**
**LAFAYETTE COLLEGE,**
**EASTON, PA.**

**RICHARD H. BUEL,**
**Mechanical Engineer,**
80 BROADWAY.
Plans and estimates prepared. Machinery and processes examined and tested.

**A. W. HALE, A. M., E. M.**
**CIVIL AND MINING ENGINEER,**
AND
ANALYTICAL CHEMIST,
**LABORATORY, 71 BROADWAY, NEW YORK.**

**C. A. STETEFELDT,**
MINING ENGINEER
AND
**METALLURGIST,**
**Office Stetefeldt Furnace Company,**
No. 411½ CALIFORNIA STREET,
San Francisco, Cal.

**JOHN C. RANDOLPH, A.M., E.M**
(RECENTLY IN SERVICE OF THE JAPANESE GOVERNMENT,)
**Mining Engineer and Geologist,**
**No. 35 Broadway,**
NEW YORK.

**W. BREDEMEYER,**
**Mining**
**Consulting and Civil Engineer,**
**AND U. S. MINERAL SURVEYOR.**
Working plans and estimates for mines and improvements furnished; will superintend the establishment and working of mines.
The concentration of ores a specialty.
Agent for the Humboldt Company (manufacturers of Mining and Concentrating Machinery.)
For plans and information apply at my office, No. 12 Kimball block, Salt Lake City, Utah.
I am prepared to take contracts on tunnels and the sinking of shafts.

**D. ERNEST MELLISS, A. M., Ph. D.,**
**MINING ENGINEER AND GEOLOGIST,**
52 BROADWAY,
NEW YORK.

**WILLIAM M. COURTIS,**
**Metallurgist and Mining Engineer.**
Address
Post Office Box Eleven, Wyandotte, Michigan.

**STUART M. BUCK,**
**MINING ENGINEER,**
Kanawha and Ohio Coal Company.
COALBURG, WEST VIRGINIA.
Examines and reports on Coal Lands, and consults on the opening and working of Mines.

**E. GYBBON SPILSBURY,**
**Consulting Civil & Mining Engineer.**
Mining Properties examined and reported on. Plans and estimates made for every kind of Mining Machinery.
The concentration of ores a specialty.
**187 Broadway,** Street level,
**New York.**

**M. F. MAURY,**
*Fellow of the Geological Society of London; Member of the American Institute of Mining Engineers; Associate of the Royal School of Mines, England.*
**Geologist and Mining Engineer.**
CHARLESTON, KANAWHA CO., W. VA.
**Coal and Iron a Specialty.**
All kinds of Surveying done. Advice given as to the advantageous partition of Mineral Lands, Consulting Mineralogist, etc.

**ROTHWELL'S GREAT MAP OF THE WYOMING VALLEY.**

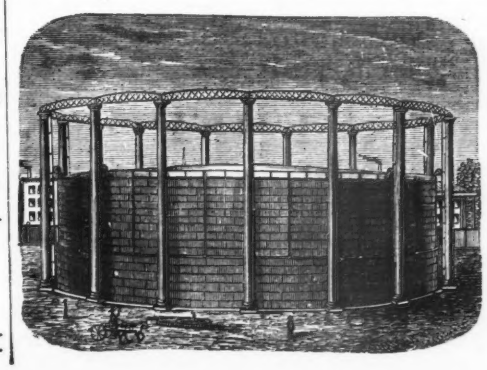
This, the most elaborate and accurate topographical map ever made in this country, outside of the Coa Survey, covers an area of
**200 SQUARE MILES,**
**And the Work upon it Cost over $12,000.**

It represents a coal field which produced, in 1874, over 10,000,000 tons of Anthracite, and was constructed altogether from original surveys. Every road, colliery, building, and land or property line is accurately located. The surface configuration is shown by *Contour Lines* 10 *feet apart, vertically*—and the elevation of every point above sea level is given.
But a small edition of this map was printed and the plates were then destroyed.
*A few copies are for sale at*
**$65 in sheets, or $85 colored and mounted on cloth.**
The 6 sheets can be mounted separately or in a single roll 15 feet long by 42 inches wide.
Address: **ENGINEERING AND MINING JOURNAL,**
**27 Park Place, New York.**

**LEHIGH ZINC COMPANY.**
GORDON MONGES, Treasurer. B. C. WEBSTER, President.
**WORKS, BETHLEHEM, PA. OFFICE, 333 Walnut Street, Philadelphia.**
JOHN JEWETT & SONS, AGENTS, 182 FRONT STREET, NEW YORK.
OXIDE OF ZINC, SPELTER, SHEET ZINC

GEO. H. REYNOLDS,
**MECHANICAL AND MINING ENGINEER,**
**No. 10 COURTLAND STREET, N. Y.,**
Furnishes every description of
**Mining Machinery,**
Plans, Specifications, Estimates, &c.
Hoisting Machines, Air Compressors, Mine Pumps and Rock Drills a Specialty.

**STEEL AND IRON WIRE ROPES,**
**For Mines, Inclined Planes, Wire Rope Tramways, Transmission of Power, Suspension Bridges, Ship's Rigging, &c,**
MADE BY
**THE HAZARD MANUFACTURING COMPANY,**
WILKES-BARRE, PENN'A.
This Company has the Largest and Most Perfect Rope-making Machinery in the World. Capable of making Ropes of any size from Sash Cord to Ropes Sixty Tons Weight, without a Splice.
**None but the Very Best Material Used.**
These Ropes are used more generally than any others throughout the Coal Regions. Reference is made to the Lehigh and Wilkes-Barre Coal Company, the Riverside Coal Company, and others.
**For Prices, Instructions on the Use of Wire Ropes, and other Information, address**
**THE HAZARD MANUFACTURING COMPANY,**
**WILKES-BARRE, PENN'A.**



**CONTINENTAL WORKS,**
*GREENPOINT, BROOKLYN, N. Y.*
NEAR THE TENTH-STREET FERRY.
**T. F. ROWLAND, Engineer and Contractor.**
For the Construction and Erection of Gas Work Apparatus of any magnitude.
Plans and Specifications Prepared, and Proposals given for the necessary plant, for lighting cities, towns, mansions, and manufactories.
Steamers, Ferry-Boats, Railway Cars, etc., arranged for Gas Light, in the most approved and practicable manner.
Gas Holders, Cast and Wrought Iron Tanks, Retorts, Hydraulic Mains, Condensers, Scrubbers, Purifiers, Governors, Exhausters, Stop-Valves, and all articles connected with the Manufacture and Distribution of Gas, furnished with dispatch, on the most reasonable terms.

COXE BROS. & CO., CROSS CREEK COLLIERY, MINers and Shippers of the Celebrated
Cross Creek Free Burning Lehigh Red Ash
COAL.
FROM THE BUCK MOUNTAIN VEIN.
Unexcelled for Steam, Sugar House and Domestic use.
WESTON, DOBSON & CO., Sole Agents,
General Office: Bethlehem, Pa.
Branch Office: 206 South Fourth street, Philadelphia.
Agents in New York, MEEKER & DEAN,
Rooms 16 and 18 Trinity Building.

C. A. BLAKE & CO.,
Agents for the sale of
Hillside Coal and Iron Company's
COAL.
Docks for the receiving and shipping of Coal and other heavy freights.
OFFICES:
BUFFALO,
7 Main street.
Waverley, opposite Erie Railway Depot.

BORDA & KELLER,
KOH-I-NOOR COAL.
Old Company—Lehigh—Wilkes-Barre—Plymouth, Red Ash—on board at Philadelphia.
OFFICES:
326 Walnut St., Philadelphia.
77 State St., 5 Doane St., Boston,
Wharf No. 4, Port Richmond.

PERKINS & JOB,
GAS COALS AND CANNEL,
FROM THE
Westmoreland—Cannelton—Red Bank—Youghiogheny and Provincial Mines.
91 State St., Boston,
27 South St. New York.

J. D. HEISSENBUTTEL,
SHIPPER AND WHOLESALE DEALER IN
Schuylkill, Lehigh, Cumberland, Scranton, and Wilkesbarre White Ash.
Also the Coal of the
Phila. and Reading Coal and Iron Co.,
ROOM 71, TRINITY BUILDING, 111 BROADWAY, NEW YORK.

E. A. PACKER & CO.,
MINERS AND SHIPPERS OF
COAL,
*IN ALL THE DIFFERENT VARIETIES.*
For Families, Manufacturers, and Steam uses generally.
Shipments made to all points accessible from New York.
E. A. PACKER & CO.,
Room 29, Trinity Building. 111 Broadway, N. Y.

PENN GAS COAL CO.,
OFFER THEIR COAL SCREENED FOR GAS PURPOSES.
Their property is located in the Youghiogheny coal basin near Irwin's and Penn Stations, on the Pennsylvania Railroad, and on the Youghiogheny River, Westmoreland County, Pa.
PLACES OF SHIPMENT: Pennsylvania Railroad Pier No. 2, (lower side); Greenwich Wharves, Delaware River; Pier No. 1, (lower side), South Amboy, N. J.
OFFICES: No. 90 WALL STREET, NEW YORK,
No. 11 Merchants' Exchange, Philadelphia.

The Rockhill Iron and Coal Co.,
MINERS AND SHIPPERS OF
East Broad Top Semi-Bituminous Coal,
Office No. 320 Walnut street, Philadelphia.
Agent, WM. MERSHON, Trinity Building,
111 Broadway, New York.

WARD, TALBOT & OLYPHANT,
Agents for the Delaware and Hudson Canal Company's
LACKAWANNA COAL,
Also George's Creek Cumberland Coal, Direct from the Mines.
HERBERT D. WARD,
RICHMOND TALBOT,
ROBERT OLYPHANT.
OFFICES { 71 Broadway, New York.
75 State Street, Boston, Mass.

WM. BORDEN. L. N. LOVELL.
BORDEN & LOVELL,
CUMBERLAND COAL,
FOR RAILROAD, STEAMSHIP AND GENERAL USES.
Unexcelled in quality by any from this region. Shipments made at Georgetown, D. C.; Baltimore, Md.; and South Amboy, N. J.
Offices, 70 and 71 West Street, New York.
AGENTS FOR THE SALE OF
FALL RIVER IRON WORKS COMPANY'S NAILS, BANDS, HOOPS AND RODS.

DETMOLD & COX,
MINERS AND WHOLESALE COAL MERCHANTS,
TRINITY BUILDING, NO. 111 BROADWAY,
C. E. DETMOLD, JAMES S. COX. (Rooms Nos. 38, 40 and 42,) New York.
HONEYBROOK and other first-class LEHIGH COALS. Also WILKES-BARRE. Agents for "Middle Lehigh Coal Co.," of Mauch Chunk, Pa., and "KITTANING COAL CO." (Bituminous) of Pa. George's Creek Cumberland at all points.

PHILADELPHIA AND READING COAL AND IRON COMPANY
OFFER
*HARD AND FREE WHITE ASH COALS, SCHUYLKILL RED ASH, ALASKA RED ASH, SHAMOKIN WHITE ASH, SHAMOKIN RED ASH, NORTH FRANKLIN, LORBERRY AND LYKENS VALLEY COAL*
On Board at Port Richmond, Philadelphia, or Delivered in New York, and at all Ports along the Sound and Hudson River.
OFFICES:
227 South Fourth Street, Philadelphia; No. 9 Broad Street, New York, and 8 Exchange Place, Boston.

CALDWELL, WESTON & CO.,
WHOLESALE COAL MERCHANTS,
Rooms Nos. 28 and 30, TRINITY BUILDING 111 BROADWAY, NEW YORK,
SOLE AGENTS FOR THE
Primrose Lehigh, Lucas' Buck Mountain, and Eureka Bituminous Coal's.
Also Dealers in Pittston, Scranton, Lehigh and other Coals.
J. W. CALDWELL WALTER WESTON. J. W. ROCKWELL.

COAL.
LACKAWANNA VALLEY, KINGSTON, WYOMING WHITE ASH. CHAUNCEY, WYOMING RED ASH. CROSS CREEK AND BEAVER BROOK, LEHIGH,
DELIVERED ON BOARD VESSELS AT HOBOKEN, N. J.
MEEKER & DEAN,
23 Doane St., Boston. 111 Broadway, New York.

PITTSTON COAL,
PENNSYLVANIA COAL COMPANY,
JOHN EWEN, President.
GEO. A. HOYT, Treasurer.
ED. H. MEAD, Secretary.
TRINITY BUILDING,
111 Broadway, New York.

FREDERIC A. POTTS,
WHOLESALE
COAL AND IRON MERCHANT.
ANTHRACITE AND BITUMINOUS COALS,
Embracing Old Company Lehigh (Summit Hill), Room Run, (Free burning White Ash), Plymouth Wyoming Red Ash Coal, also the celebrated Baltimore Vein Wilkes-Barre Coal, Hampshire and Barton George's Creek Coal.
Offices: 110 Broadway, New York, P. O. Box 3404,
METROPOLITAN BANK BUILDING, No. 23 Westminster Street, Providence, R. I.

# MARYLAND COAL COMPANY,

MINERS AND SHIPPERS OF GEORGE'S CREEK

## CUMBERLAND COAL

OF THE BEST QUALITY.

SHIPMENTS FROM BALTIMORE, OR OVER IMPROVED RAILWAY CHUTE FROM GEORGETOWN, D. C., IN SUPERIOR ORDER AND AT ATTRACTIVE PRICES.

OFFICES, 15 & 17 TRINITY BUILDING
No. 111 Broadway.

# The Waverly Coal and Coke Co.

Offer for Sale the

## YOUGHIOGHENY COAL,

DOUBLE SCREENED.

from their Colliery at Smith's Mills, on the Youghiogheny River, thirty-seven and a half miles south-east of Pittsburgh. This Coal has the preference in Pittsburgh over all other YOUGHIOGHENY COAL for GAS PURPOSES. The facilities of the WAVERLY COMPANY are unsurpassed by those of any other Company on the Youghiogheny. Full particulars can be had by addressing

PERKINS & JOB, Agents,
27 South Street, New York.
91 State St eet, Boston.

# Lehigh and Wilkes-Barre Coal Co.

Summit Hill Lehigh,
Wilkes-Barre, From the Baltimore Vein,
Plymouth Red Ash Wyoming,
HONEY BROOK WHITE ASH LEHIGH.

ALL THESE COALS ARE MINED AND SHIPPED FREE FROM IMPURITIES.

The extent of property owned by this company comprises :

THE LEHIGH BASIN—running from Mauch Chunk to Tamaqua, equal to nine miles.
THE HONEY BROOK BASIN—from Audenried to the Girard Estate, equal to six miles.
THE WILKES-BARRE BASIN—running from Wilkes-Barre to Newport, about ten miles.

The land in each district lies together, not being in detached portions like that of the other large corporations ; and contains over 800 000,000 tons of coal

OFFFICES, 80 BROADWAY, N. Y.

JOHN F. WILSON, GENERAL SALES AGENT.

A. S. SWORDS,
WHOLESALE DEALER IN
PITTSTON, LACKAWANNA,
AND OTHER VARIETIES OF
ANTHRACITE COAL,
111 BROADWAY (Room 23, Trinity Building), NEW YORK.

## THE HOBOKEN COAL CO.,

DEALERS IN
SCRANTON, LEHIGH,
*AND OTHER COALS.*

Retail Yard on D., L. & W. R. R., corner GROVE and NINETEENTH STREETS, Jersey City.
*Coal delivered direct from Shutes to Carts and Wagons.*
Families supplied with the best qualities of Coal at the Lowest Rates. Steamboats, Tugs, and Manufacturers supplied with

**Coal, Wood and Water,**

from their Wharves at Hoboken.
OFFICES—At Yard, corner Grove and Nineteenth streets ; corner Bay street and Newark avenue, Jersey City ; Room 35, 111 Broadway, New York.
GENERAL OFFICE—Bank Building, corner Newark and Hudson streets. P. O. Box 147, Hoboken.

## G. B. LINDERMAN & CO.,

MINERS,

Sugar Loaf, Lehigh Coal,

OFFICE 50 TRINITY BUILDING, 111 BROADWAY,

*NEW YORK.*

## WILLIAM D. MARVEL,
Coal and Iron Merchant,

[ROOM 61 TRINITY BUILDING,]
No. 111 BROADWAY,
NEW YORK,
*ANTHRACITE AND BITUMINOUS COALS,*
American and Foreign Pig Iron,
RAILROAD RAILS,
Charcoal Pig, Bloom, and Billet Iron for Steel Works,
Spanish Ores for Bessemer Works,
Fire-Brick, Fire-Clay, etc., etc.

P. O. Box 5422. Established 1869.

WM. HEISSENBUTTEL. JOS. K. WELLS.
HEISSENBUTTEL & WELLS,
Shippers and Wholesale Dealers in
LEHIGH, WILKES-BARRE, LACKAWANNA, SCRANTON, AND PHILA. AND READING COAL AND IRON CO.
Superior Red and White Ash Coal,
FOR STEAM AND DOMESTIC USE.
ROOM 72. 111 BROADWAY, NEW YORK.
Send for Prices.

## THE HUDSON COAL COMPANY.

STEAMBOATS AND TUGS supplied with COAL, WOOD AND WATER, with dispatch, at any hour of the day or night, at their pier foot of Sixth street, Hoboken.
Schooners and Sloops loaded without delay.

General Office, 17 Newark street,
P. O. Box 176. Hoboken, N. J.

## Portland, Roman & Keene's CEMENTS.

S. L. MERCHANT & CO., Importers,
(Entrance on Maiden Lane.) 76 South street, New York.
Send for Treatise on Cements. Furnished free.

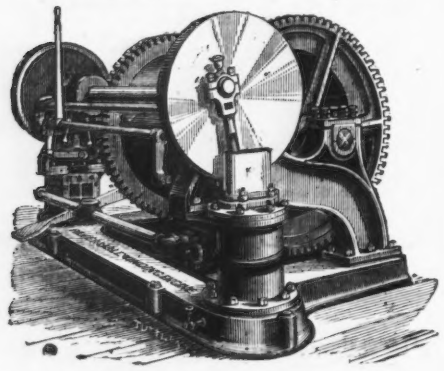
SOLE REPRESENTATIVE
OF THE
TERRE NOIR COMPANY
AND OF THE
French Ferro-Manganese Co.
H. CHAMPIN,
43 Exchange Place, New York.

## OLIVER'S POWDER.

This Powder recommends itself for its
SUPERIOR STRENGTH
AND
FREEDOM FROM SMOKE.

Direct orders to
PAUL A. OLIVER,
WILKES-BARRE, PA.

# BACON'S
## HOISTING ENGINES
FOR MINES, BLAST FURNACES.



QUARRIES, CONTRACTORS, ETC.

*20 DIFFERENT STYLES ADAPTED TO EVERY POSSIBLE DUTY.*

COPELAND'S WIRE ROPE,

*MINING MACHINERY.*

**COPELAND & BACON,**
**85 Liberty Street, New York.**

## MINING MACHINERY.
**MOREY & SPERRY,**
**88 Liberty St., New York.**

STEEL SHOES & DIES,

Made by our improved process. After many years of patient research and experiment, we have succeeded in producing STEEL SHOES AND DIES FOR QUARTZ MILLS, which are unequalled for strength, durability, and economy; will wear three times longer than any iron shoes. We manufacture, and contract to erect, Gold and Silver Reducing and Amalgamating Machinery in all its details, Pans, Separators, Concentrators, Jigs, Rock Breakers, and Furnaces. *Furnishers of Mining Supplies.* All orders promptly filled. Examinations solicited.

**MOREY & SPERRY.**

# Amer. Diamond Rock Boring Co.
SUCCESSORS TO THE AMERICAN DIAMOND DRILL CO.
**MANUFACTURERS OF**
## DIAMOND POINTED ROCK DRILLS.
**OFFICES,** {**37 Weybosset Street, Providence, R. I.**
{**61 Liberty Street, New York.**

The **only machines** with which **mines** can be penetrated a thousand feet and upwards, through **solid rock,** at any angle from vertical to horizontal, and **perfect samples,** in the form of a **core or solid cylinder,** taken out the entire depth, developing fully the nature and character of the strata.

Adapted also to **Shafting, Gadding, Channeling, Tunneling, Open Cut Work,** and all kinds of **Rock Excavations.** Illustrated Catalogues and Price List furnished on application.

Also furnish **Air Compressors, Hoisting Engines, Boilers, Pumps,** and all descriptions of **Mining Machinery.**

**C. H. TOMPKINS, General Agent,**
P. O. Box, 1442. 61 Liberty street, New York.

# RAND AND WARING
## DRILL AND COMPRESSOR COMPANY.
21 Park Row, Opposite New Post Office,
**NEW YORK.**

Send for Circulars.

**Actual Work done at Trial at Port Henry Mine.**

| | | *Rand.* | *Ingersoll.* | *Waring.* |
|---|---|---|---|---|
| First Week, | feet, | 459½ | 288 | .... |
| Second " | " | 459 | 257 | 136 |
| | | 918½ | 545 | 136 |

# AIR COMPRESSORS
THE COMPRESSED AIR POWER CO.
OFFICE & WAREHOUSE 10 COURTLAND ST. N.Y.
SEND FOR DESCRIPTIVE LIST.

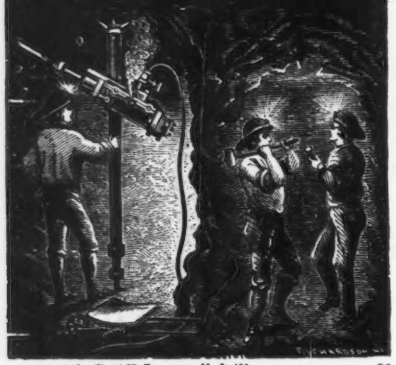
**J. S. MUNDY,**
MANUFACTURER OF HIS
**IMPROVED PATENT FRICTION HOISTING, PUMPING AND MINING ENGINES**
(FROM 5 TO 60 HORSE POWER),
**Machinery of all Kinds, Steam Boilers, Etc.**
**No. 7 R. R. Avenue, Newark, N. J.**
*SEND FOR CIRCULAR.*

# STEEL CASTINGS.
Solid and Homogeneous. Guaranteed tensile strength, 25 Tons to square inch. An invaluable substitute for expensive forgings, or for Cast Iron requiring great strength. Send for circular and price list to

McHAFFIE STEEL CO., Evelina St., Philadelphia, Pa.

Comparison of Rock Drills at Port Henry Mines, New York.

# THE INGERSOLL ROCK DRILL CO.
**5 PARK PLACE, N.Y.**
OFFER THEIR MACHINES ON TRIAL AND CLAIM 40 PR. CT. INCREASED POWER OVER ANY DRILL IN EXISTENCE.
SEND FOR CATALOGUE.



First week with **ONE** Ingersoll drill.....288 feet.
Second week " " " " .....257 "
545 "

First week with **THREE** Rand drills.....459½ ft.
Second week " " " " .....459 "
918½ ft.

**WARING'S IMPROVED SELF-FEEDING**
# ROCK DRILL.
By far the most simple and effective machine for all descriptions of
**MINING WORK of all kinds.**

Office of BELDEN & DENNISON, Contractors for Croton Reservoir,
*Brewster's, N. Y., April 27, 1875.*

WARING ROCK DRILL CO., 187 Broadway, N. Y.,

GENTLEMEN: In reply to your inquiry of a late date as to the working of your drills, we would say that we have had two, one 5 inch, and one 2¾ inch machine, in use on this work for the past 5 months, and we are so well pleased with them, we would like you to send us a 3½ in. machine as soon as possible. We claim a large saving by the use of steam over hand drilling. The rock being very hard and full of seams, makes this work a very severe test for any drill, and the working of your machines under this test satisfies us of their superior excellence. We cheerfully recommend them to any who may have use for a Rock Drill.

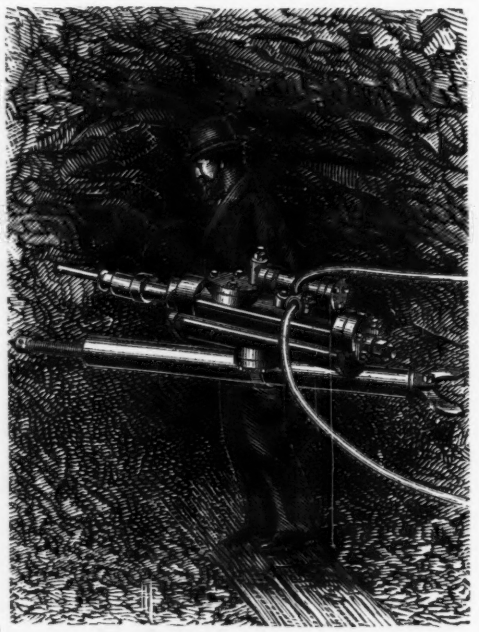
Respectfully, (Signed) BELDEN & DENNISON, by J. E. MORSE.

Also dealers in AIR COMPRESSORS, PUMPS, &c.

**WARING ROCK DRILL CO.,**
**187 Broadway, New York,**
Street level (Rear.)

Send for Circulars and Photographs.

**WOOD'S STEAM OR PNEUMATIC ROCK DRILL.**



**For all Kinds of Rock, Mining and Quarrying, and Air Compressors.**

For description see Engineering and Mining Journal of March 7, 1874. Address,

DE VOLSON WOOD Hoboken, N. J.